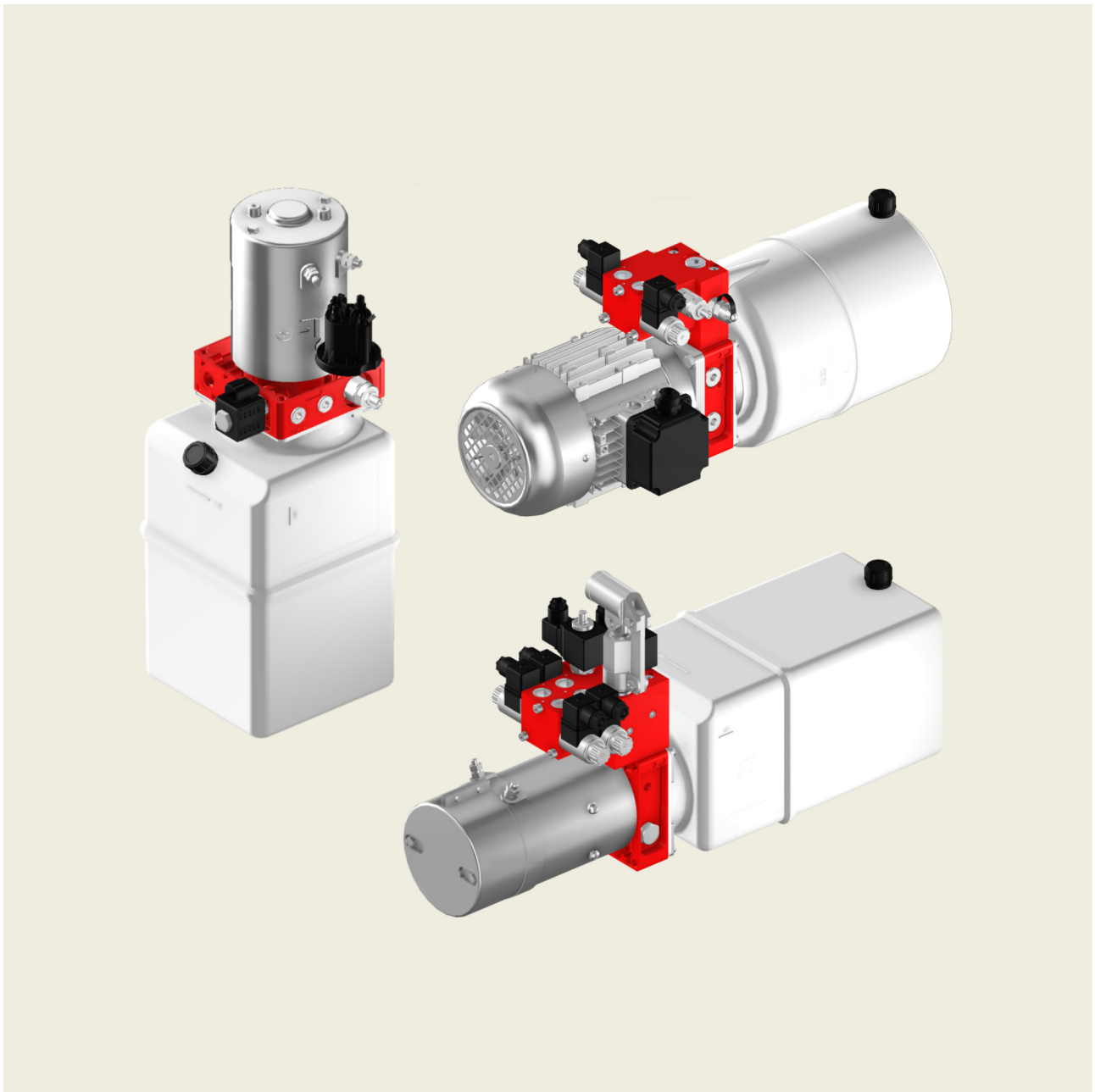


Hydraulic Units UP100

K1, K3, K4, K6, K7 S309 Standard and Low Noise versions



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General information

Experience acquired in designing mini power packs, and a research effort aimed constantly at satisfying the technical specifications of our customers: these assets have provided the principal resource for development of the UP100 power packs:

- maximum flexibility, allowing the assembly of a great number of different circuits from just 5 basic versions;
- economy of the manufactured product, gained by adopting innovative technologies and by standardizing valve cavities with those of the major hydraulic components manufacturers;
- the assurance of constant quality, thanks to comprehensive control on materials and production cycles;
- compact dimensions achieved through detailed analysis of the geometries involved, and of the components used.

Illustrated are some of the various typical applications for UP100 hydraulic power packs.

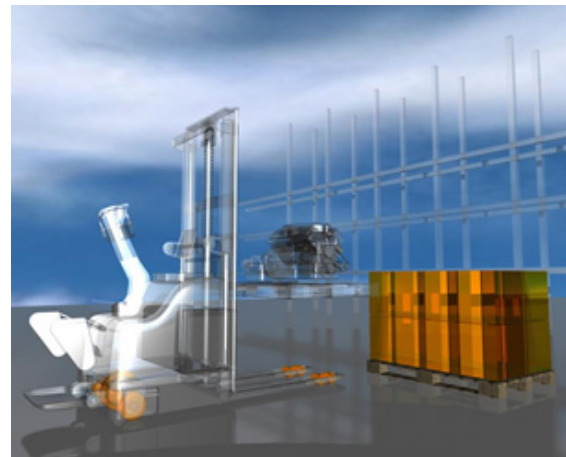
Power packs are widely utilized in the field of industrial materials handling machines. Lift trucks is a good example, where the compactness of the unit is a particular advantage in view of the limited space available.

The need for fluid power in mobile machines means that power packs can be exploited in the widest variety of applications: lift platforms, and equipment for handling high and bulky loads in general.

Given the facility of integrating power packs with valve blocks designed and constructed to selected functional and dimensional specifications, special circuits can be customized for automation of the most complex machines.

There are also countless applications for industrial machines and stationary equipment in general where the attributes of the power pack are instrumental in simplifying the hydraulic system, bringing significant saving on installation and running cost.

Low noise pump versions available





WARNING!

Bucher Hydraulics is not responsible for misuse or mis-application of product. Pressure values, type and number of cycles have to be considered before choosing the type of product. For any question about applications, please contact Bucher Hydraulics.

All the installation and maintenance operations of partially completed machinery must be made by technically competent personnel.

The hydraulic power units due to its construction does not perform the function of the safety component. So the user must insert safety components into the machine to protect against the possibility of breakage during operation.

The hydraulic power units can not function independently and are designed to be integrated into hydraulic systems.

Fluids should be contained and disposed of properly.

Prior to performing any maintenance make sure the equipment is turned off and that any stored energy, for example pressure, is released. Also, extended equipment or cylinders should be lowered and mechanically locked as required.

During the handling of the hydraulics power units, do not lift the unit by the tank or valves mounted on it (see the figure 1, the arrows indicate the points to lift). Always wear appropriate safety gloves and footwear.

Always wear eyes protection and protective clothing when working on and around hydraulic systems.

Remove jewellery and objects that might conduct electricity while working on power units.

Hydraulic fluid does pose a fire hazard, can cause burning or skin irritation if not properly handled.

Fluid under pressure can pierce the skin and enter the bloodstream causing death or serious injury.

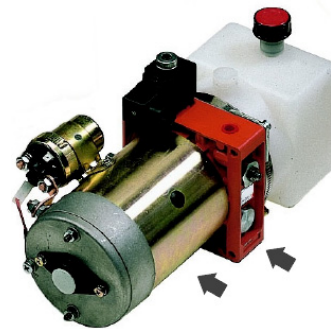
Devices being operated by the hydraulic system should be immobilized so they cannot move and cause injury while being inspected or repaired. Disconnect from electrical source.

The above warnings are to be adhered to in order to reduce the risks resulting from the normal usage of the hydraulic power units for the safety and health of the users.

The product you have purchased is guaranteed for a period according to existing regulations.

The warrant you will be void if the product has been installed or used in a manner not in accordance with our instructions, or if it was tampered with, modified, subjected to usage outside those prescribed.

Fig. 1



Directives and standards

- PED (97/23/EC)

The pressure relief valve assembled into the power pack can not to be considered and/or confused with the safety valve when the PED Directive is applied to the hydraulic system.

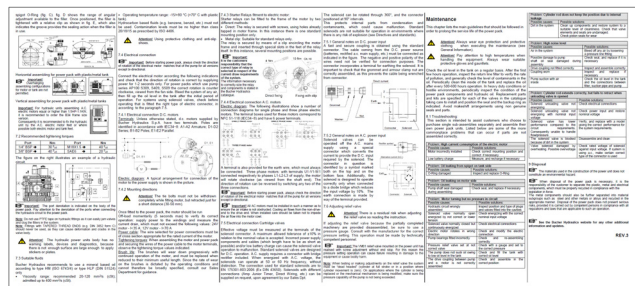
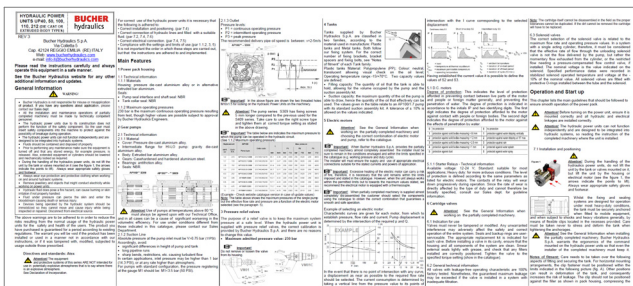
- Atex:

The equipment and protective systems of these catalogue ARE NOT intended for use in potentially explosive atmospheres. Ref: Directive 99/92/EC and Directive 2014/34/UE.

- ISO 9001:2015 / ISO 14001:2015

Bucher Hydraulics S.p.A. is certified for research, development and production of directional control valves, power units, gear pumps and motors, electro pumps, cartridge valves and integrated manifolds for hydraulic applications.

Further information are available in the dedicated documentation according to the Machinery Directive 2006/42/EC

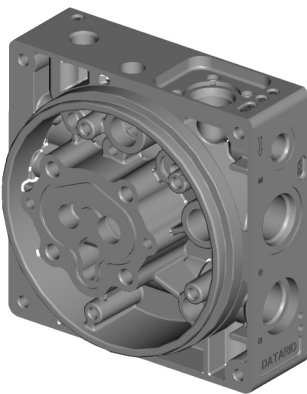
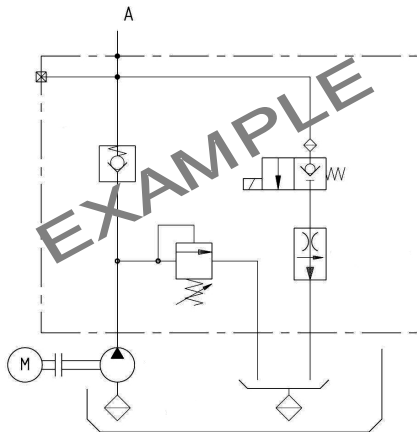


INTEGRATED HOUSINGS

Based on customer demand, many different choices are available:

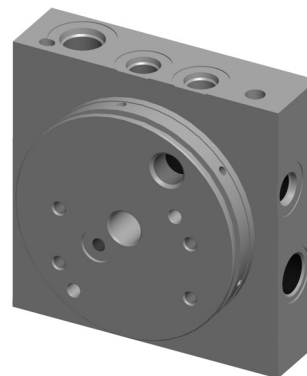
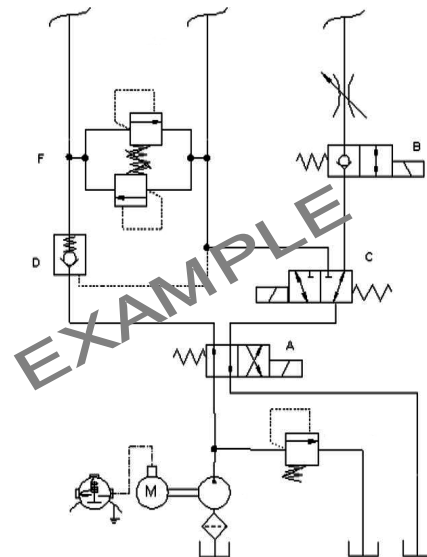
- wide range of std die-cast housings, designed for high flexibility and compact solutions

Die cast version



- Cheaper cost
- Standardised solutions

Extruded bar version



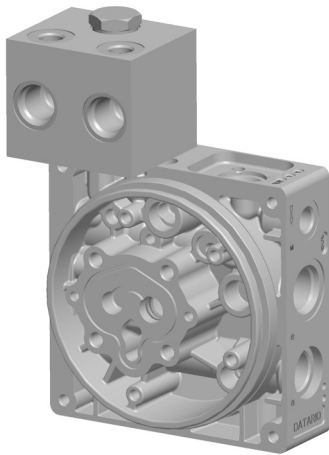
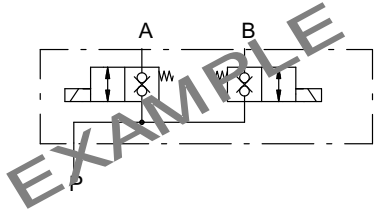
- Fully customised solutions
- Dedicated circuits and valves on Customer demand
- Flexible lay out for ports and valves position

EXTERNAL MANIFOLDS

New solutions available also for external manifolds.
A new intermediate plate 5203 has been designed to allow

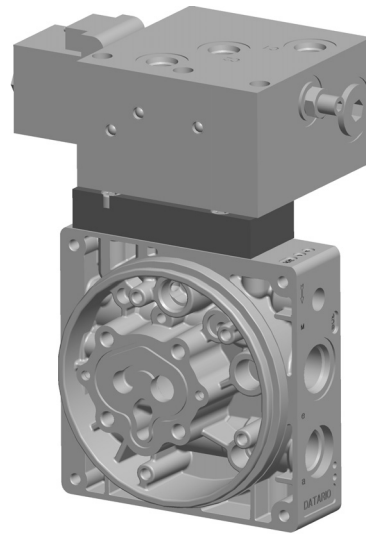
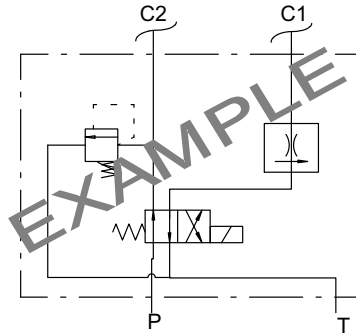
the assembling of manifolds made with alternative interface
on standard UP100K4-P0* housing.

Manifolds directly assembled on UP100 housing



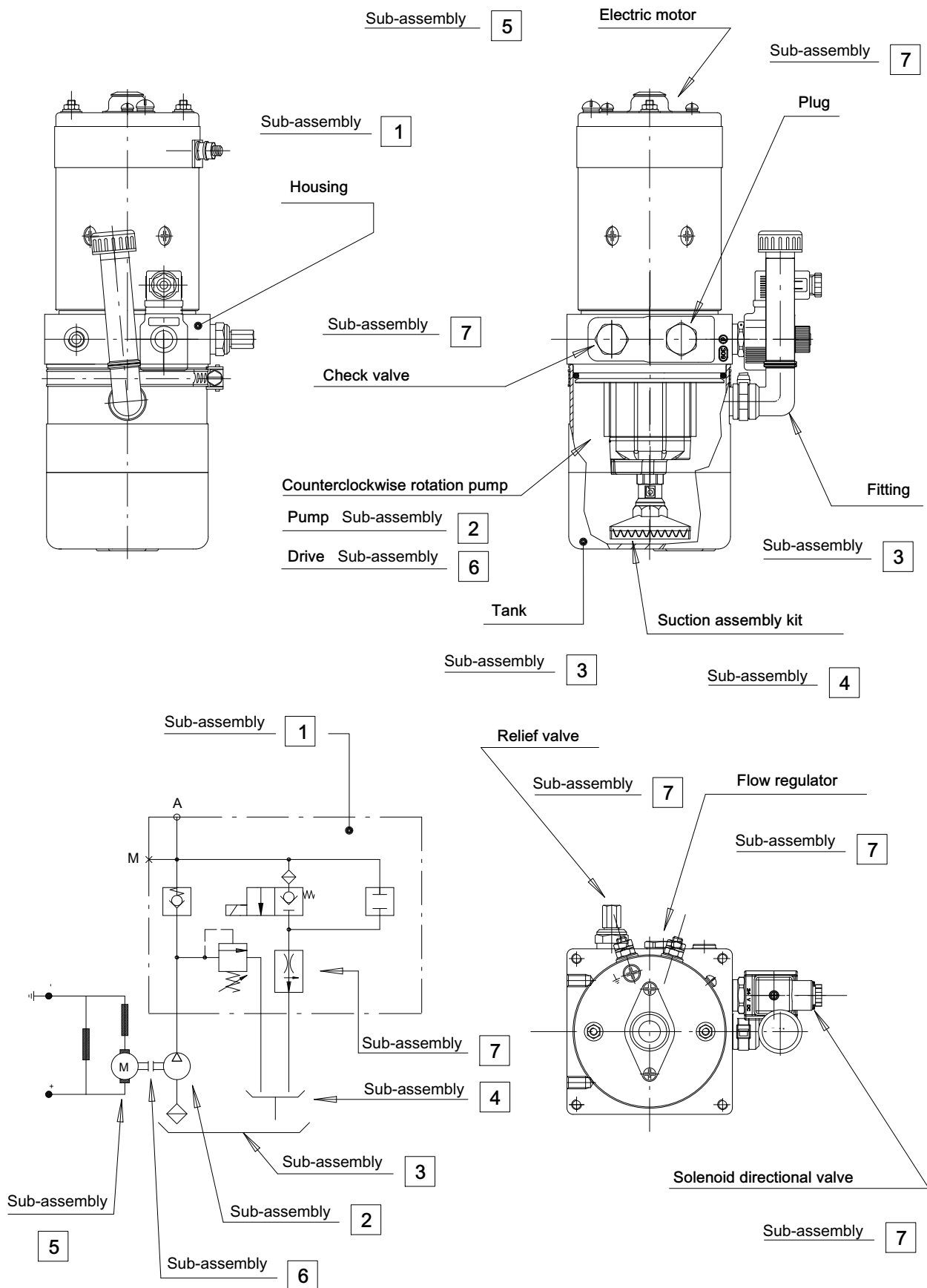
- Cheaper customised solutions
- More complicate hydraulic circuits with standardised manifolds.

Manifolds assembled with 5203 intermediate plate



- Wide range of existent or customised blocks with alternative interface.

Sub-assembly index



Sub-assemblies making up UP100 power pack

This page serves both as a guide to the contents of the catalogue and as an order form.

Simply fill in the individual sections with the designation codes for the options selected, and send direct to the Bucher Hydraulics S.p.A. Sales Center.

1	Type of housing	Vers.													
2	Pump										Hi-Lo	Series			
3	Tank					Fitting					Pos.				
4	Suction assembly kit					Tank fixing kit					Fill in this section only when ordering single sub-assemblies. Leave blank when ordering complete power packs.				
5	Electric motor					Pos.	Relay		Pos.						
6	Drive														
7	Cavity a					Cavity b					Cavity c				
	Cavity d					Cavity e					Cavity f				
	Cavity g					Hand lever		Lever stick		Volt					
8	Sequence		Manifolds			Valves for manifolds					Qty.	Volt			
9	El. n.	Sectional valve housing			Circuit	Posit.	Lever		Hand Lever		Valves for sec. valve				

1 Power pack housings

1.1 Technical information

1.1.1 Materials

Housing: pressure diecast aluminium alloy or in alternative extruded bar aluminium.

Seals:

- Pump seal interface and shaft seal: NBR
- Tank collar seal: NBR

1.1.2 Versions

Five different castings are available: K1 - K3 - K4 - K6 - K7.

1.1.3 Maximum operating pressures

230 bar is the maximum continuous operating pressure resulting from test, though higher values are possible subject to approval by Bucher Hydraulics Engineers.

1.1.4 Pumps

The five housing versions are intended for use with:

Single pump AP100 S.309 CCW rotation.

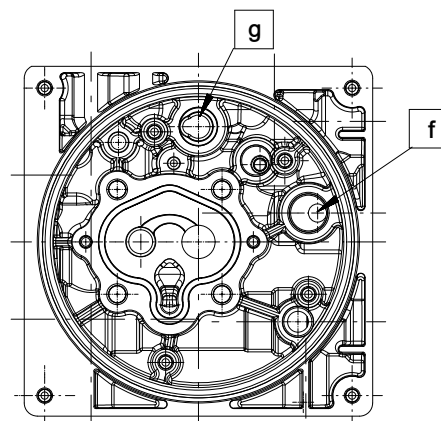
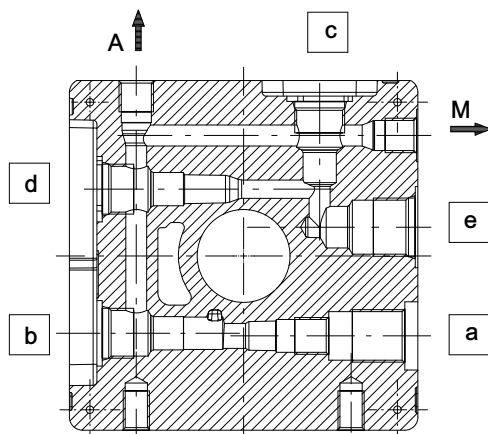
Double pump AP100+AP100 CCW rotation with integrated pressure cut-off valve for HI-LO versions.

1.1.5 Valves cavities

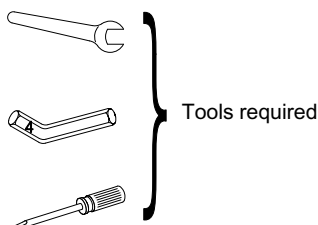
Standard cavities will allow 3/4-16 UNF and 7/8-14 UNF cartridge valves manufactured by Bucher Hydraulics S.p.A., which are interchangeable with similar components made by major European and US manufacturers.

The pressure relief valve cavity is threaded M20x1.5, according to Bucher Hydraulics standard.

A variety of hydraulic circuits can be obtained with the same housing. To facilitate the correct composition of the desired hydraulic circuit, the position of each cavity is identified by a letter. The combination letter/cavity position remain unchanged for all the various UP100K.... housings.



1.1.6 Non-standard symbols used in the text



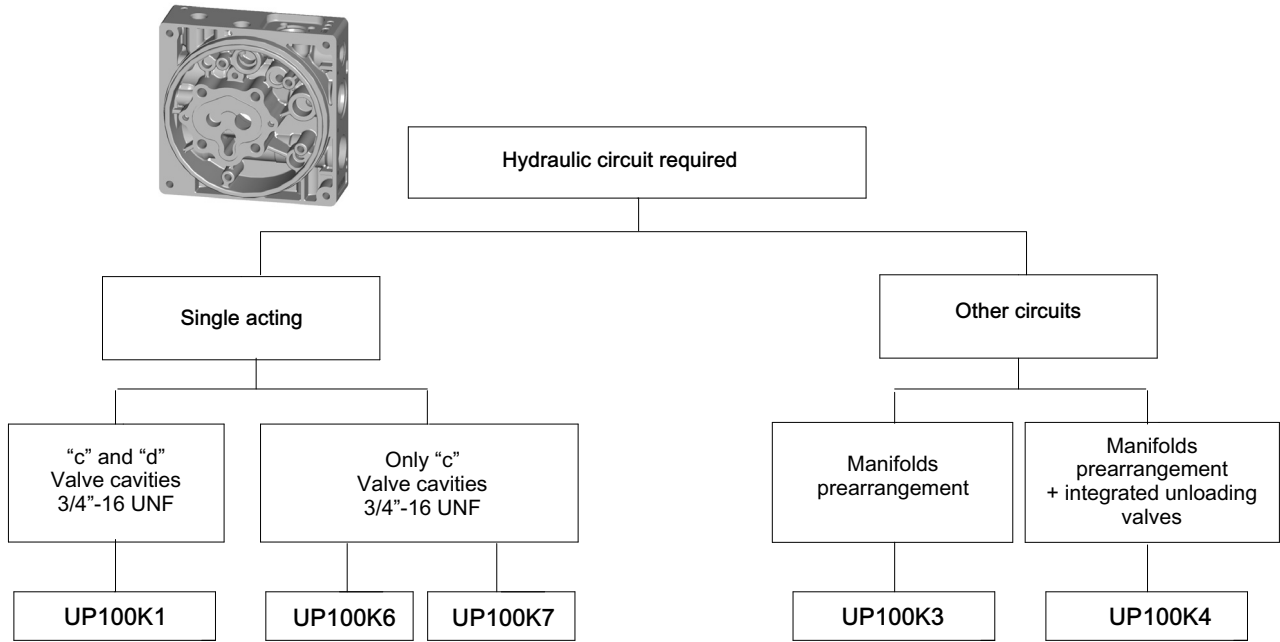
1.1.7 Recommended tightening torques

Port	Nm
- 1/4" BSP	30 ⁰ ₊₅
- 3/8" BSP	40 ⁰ ₊₅
- M18X1.5	40 ⁰ ₊₅
- SAE6	20 ⁰ ₊₅

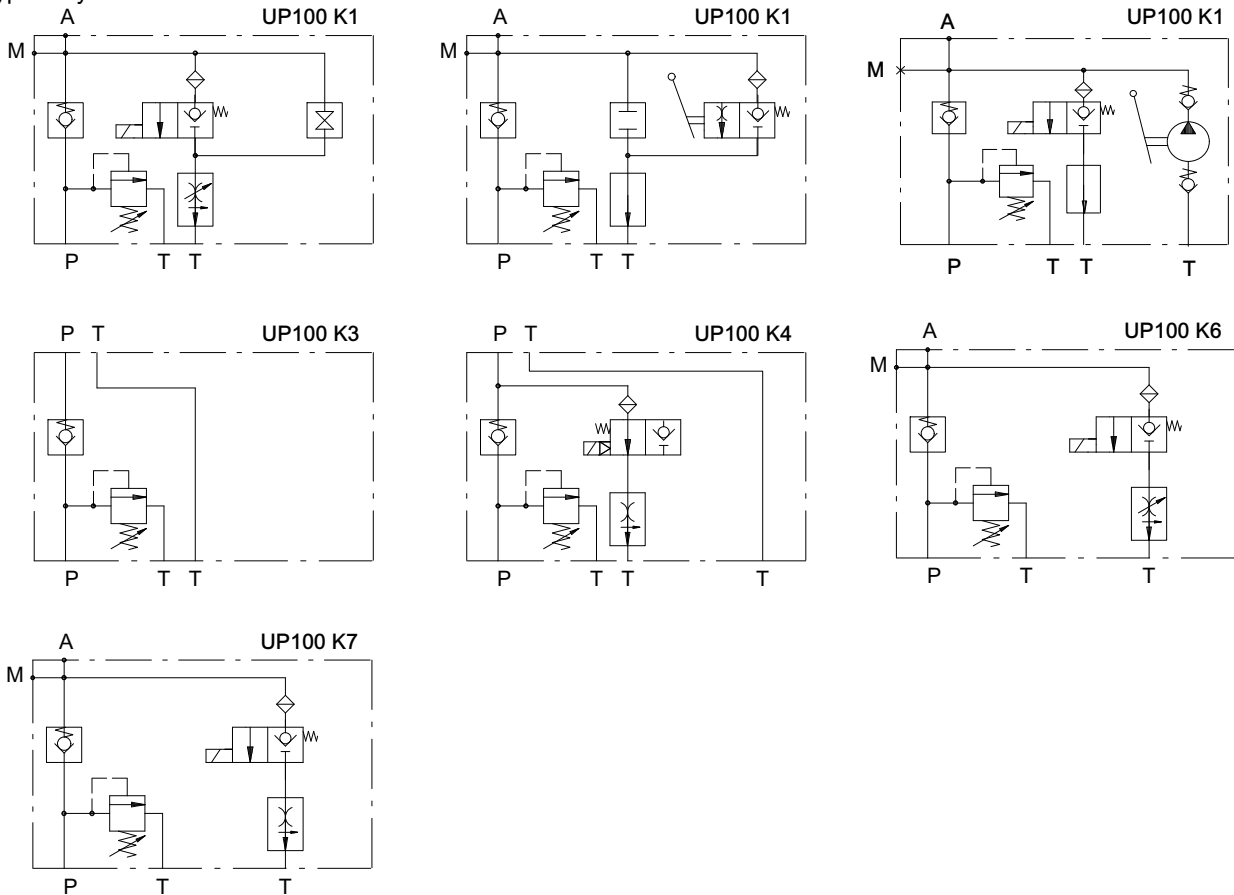


The appropriate power pack housing for the required hydraulic circuit can be identified from the following block diagram.

To facilitate selection, typical hydraulic circuits example are indicated for each housing.



Typical hydraulic circuits



1.2 Housing UP100K1 (Single acting)

1.2.1 Main specification

Cavity **a** = M20X1.5 (relief valve cavity)

Cavity **b** = 3/4"-16 UNF (check valve cavity)

Cavity **c** = 3/4"-16 UNF (directional valve cavity)

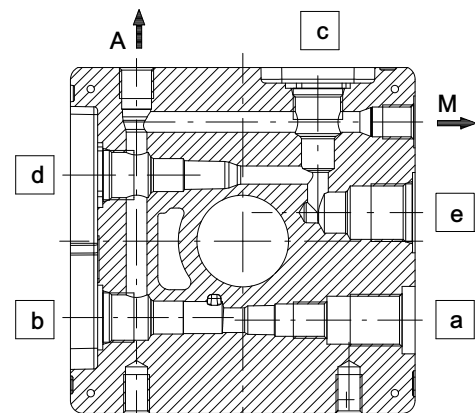
Cavity **d** = 3/4"-16 UNF (directional valve cavity)

Cavity **e** = 7/8"-14 UNF (flow regulator cavity)

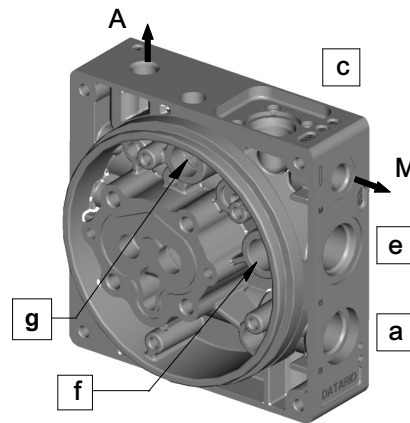
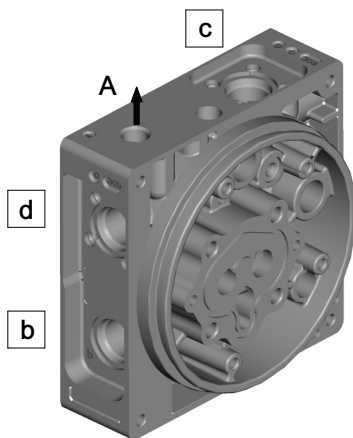
Cavity **f** = return line

- **A** = Main work port

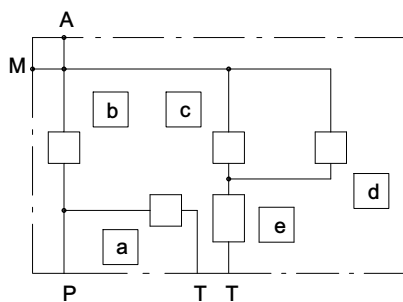
- **M** = Secondary work port



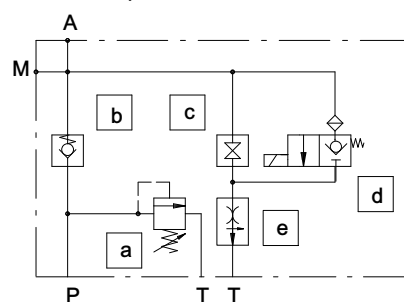
Cavities identification



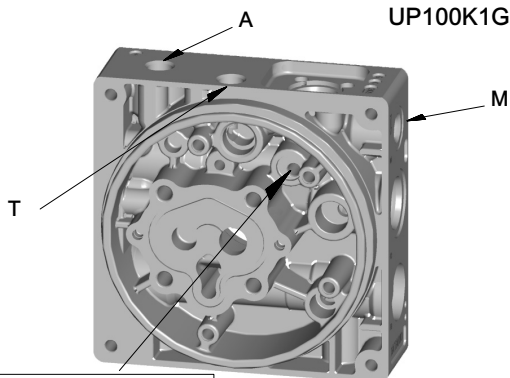
Basic circuit



Example of standard circuit

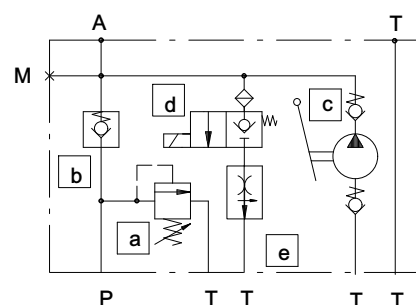


UP100K1G2-19



Suction line for PM817/1.5

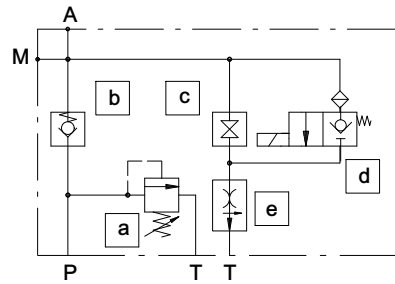
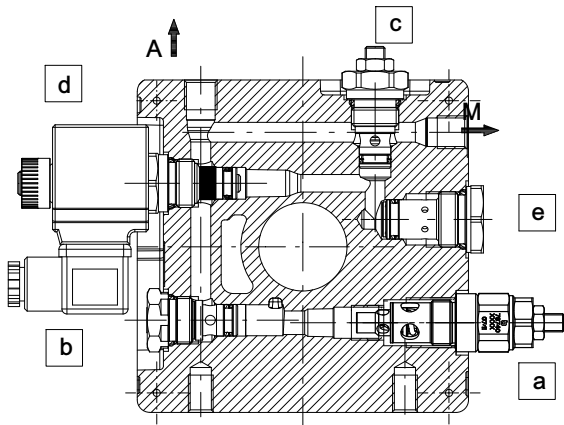
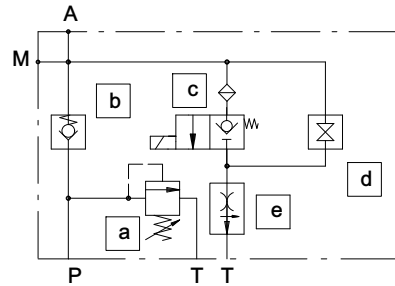
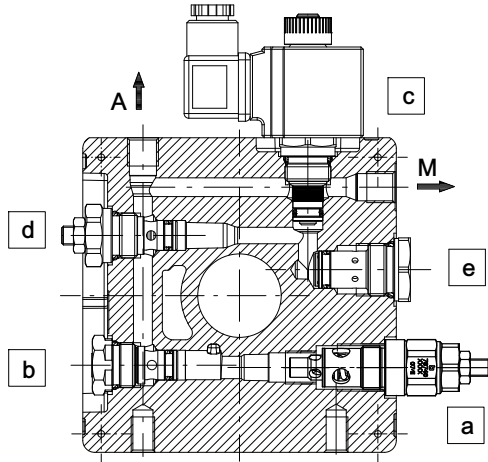
Example of realizable circuit
UP100K1G2-19 (PM817/1.5)



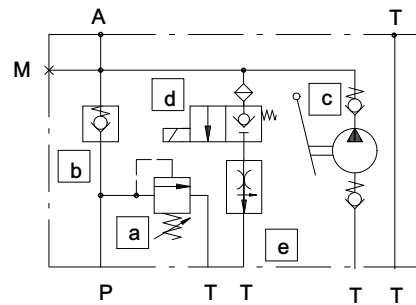
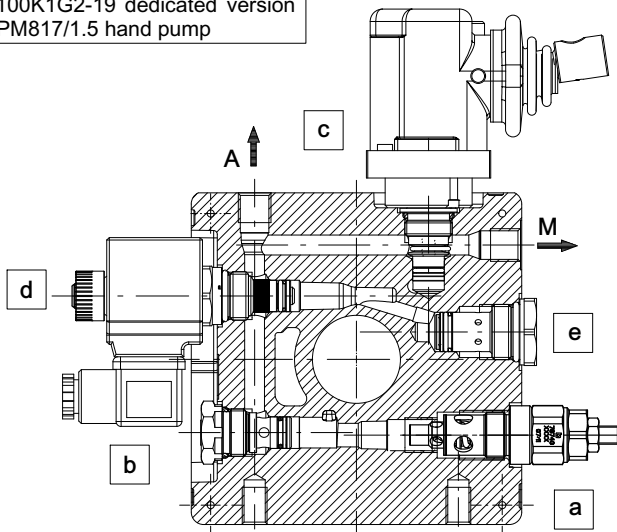
1.2.2 Flexibility of assembly

The two hydraulic circuits illustrated are identical in terms of operation but differently arranged, simply by installing the valves in alternative positions.

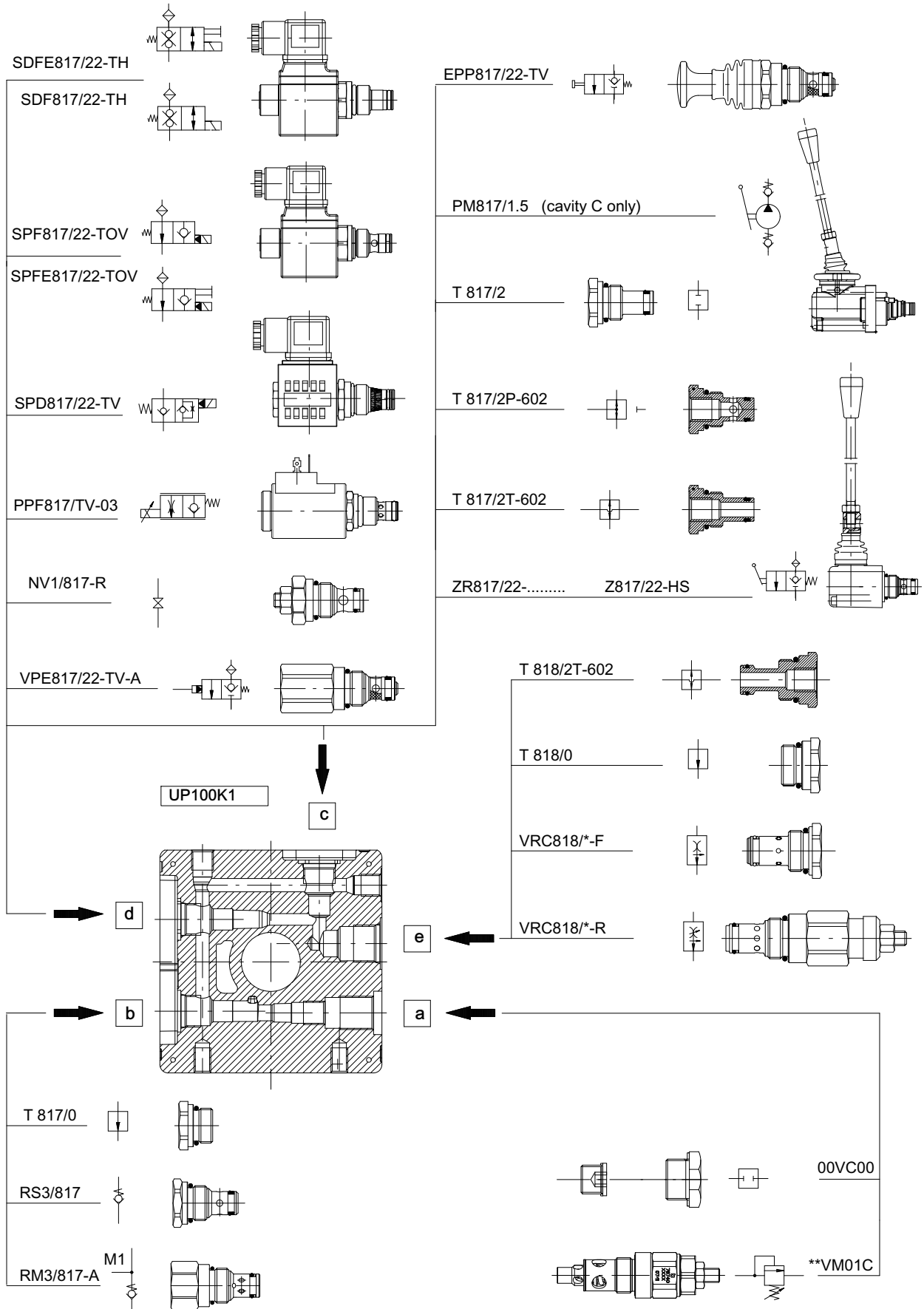
Available space can be exploited to the best advantage.



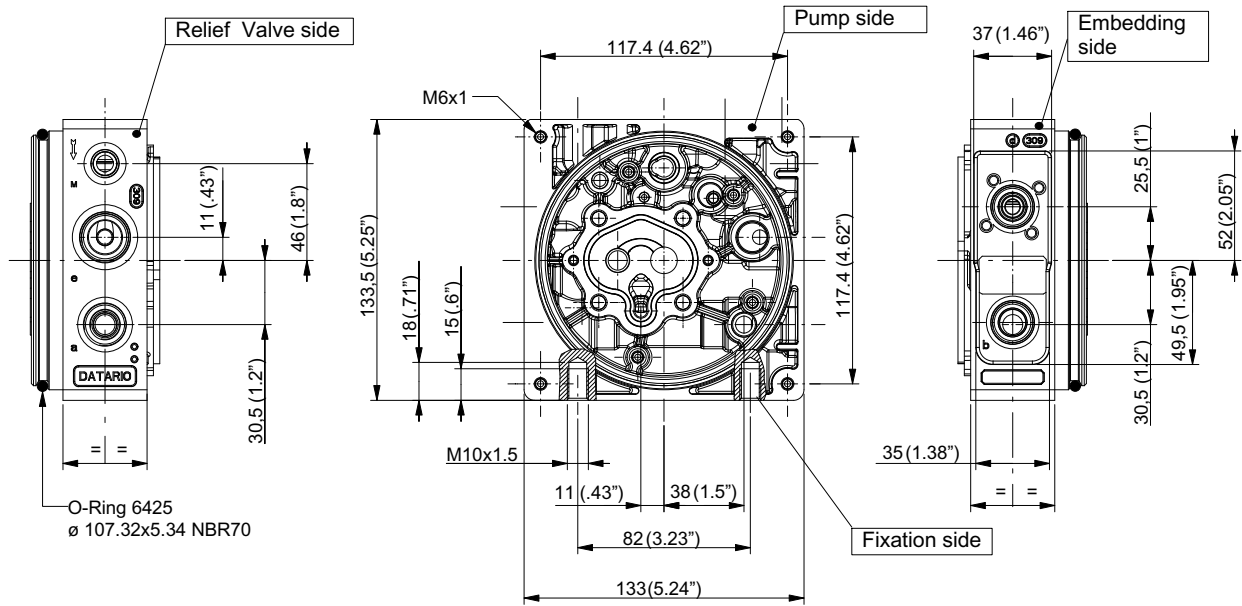
UP100K1G2-19 dedicated version for PM817/1.5 hand pump



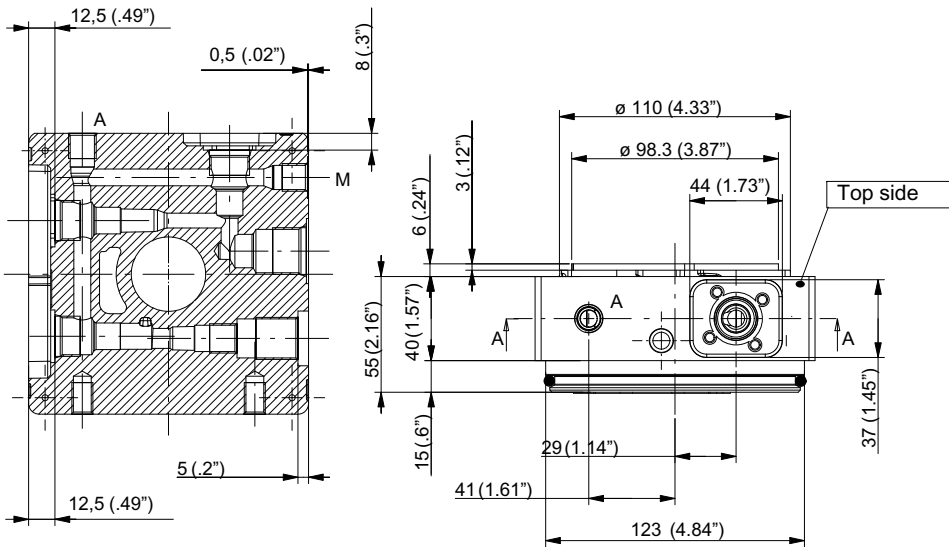
1.2.3 Component accepted by the single cavities



1.2.4 Dimensions



Sec. A-A



Supplied with port M plugged - Standard Version

Type	Port A	Port M
UP100K1G2-01	1/4" BSP	1/4" BSP

Other versions to order

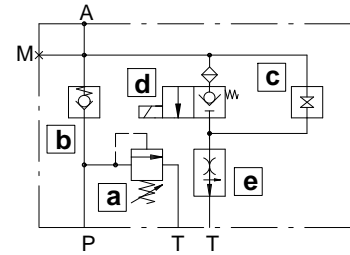
Type	Port A	Port M
UP100K1G3-01	3/8" BSP	1/4" BSP
UP100K1M3-01	M18X1.5	1/4" BSP
UP100K1S2-01	SAE6	SAE6

Example

	Type of housing										Vers.	
1	U	P	1	0	0	K	1	G	2	-	0	1

1.2.5 Examples for compilation of hydraulic power pack specification form

- UP100 Power pack set up for single acting circuit.
- Main work port A thread 1/4" BSP (secondary work port M with 1/4" BSP thread, plugged).
- VM01C pressure relief valve set at 150 bar
- RS3/817 check valve.
- NV1/817-R emergency valve fitted in cavity **c**.
- SDF817/22-TH (12 volt input) solenoid directional valve fitted in cavity **d**
- VRC818/05-F fixed flow control valve fitted in cavity **e**.

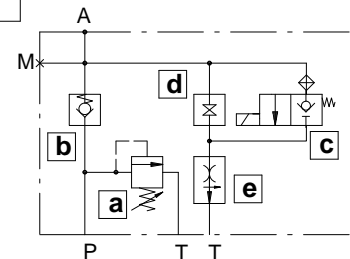


	Type of housing		Vers.
1	U P 1 0 0 K 1 G 2 -		0 1

	Cavity a	Cavity b	Cavity c
7	1 5 V M 0 1 C	R S 3 / 8 1 7	N V 1 / 8 1 7 - R
	Cavity d		Cavity e
	S D F 8 1 7 / 2 2 - T H		V R C 8 1 8 / 0 5 - F
	Cavity g	Hand lever	Lever stick
			Volt
			1 3

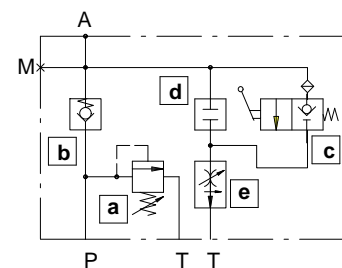
UP100 power pack with same hydraulic circuit as per above example but with:

- SDF817/22-TH solenoid directional valve fitted in cavity **c**.
- NV1/817-R emergency valve fitted in cavity **d**.



	Cavity a	Cavity b	Cavity c
7	1 5 V M 0 1 C	R S 3 / 8 1 7	S D F 8 1 7 / 2 2 - T H
	Cavity d		Cavity e
	N V 1 / 8 1 7 - R		V R C 8 1 8 / 0 5 - F
	Cavity f		

- UP100 power pack set up for single acting circuit
- main work port A threaded 3/8" BSP thread (secondary work port M threaded 1/4" BSP plugged).
- VM01C pressure relief valve set at 180 bar
- RS3/817 check valve.
- ZR817/22-TV manually operated directional valve + hand lever L10 and lever stick AL001 fitted in cavity **c**
- cavity **d** plugged with T817/2 plug.
- VRC818/B-R adjustable flow control valve fitted in



cavity **e**

	Type of housing		Vers.
1	U P 1 0 0 K 1 G 3 -		0 1

	Cavity a	Cavity b	Cavity c
7	1 8 V M 0 1 C	R S 3 / 8 1 7	Z R 8 1 7 / 2 2 - T V
	Cavity d		Cavity e
	T 8 1 7 / 2		V R C 8 1 8 / B - R
	Cavity g	Hand lever	Lever stick
		L 1 0	A L 0 0 1
			Volt
			1 3

1.3 Housing UP100K3 (Manifolds prearrangement or threaded P-T connections)

1.3.1 Main specification

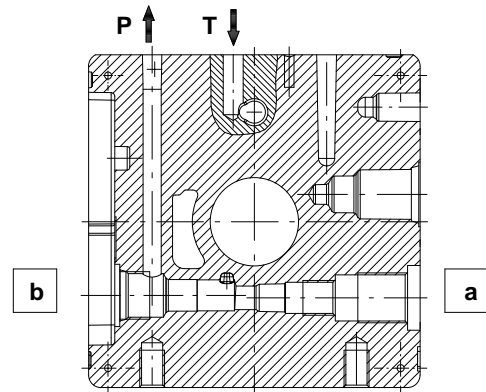
UP100/K3P0-01

Cavity **a** = M20X1.5 (relief valve cavity)

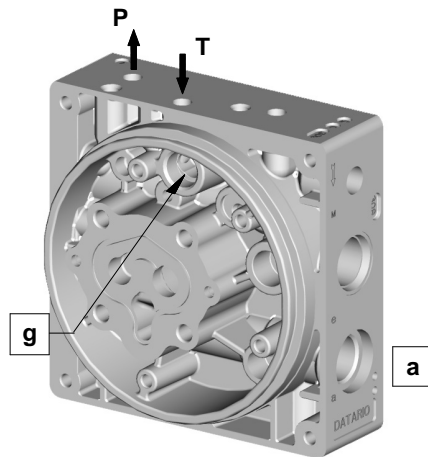
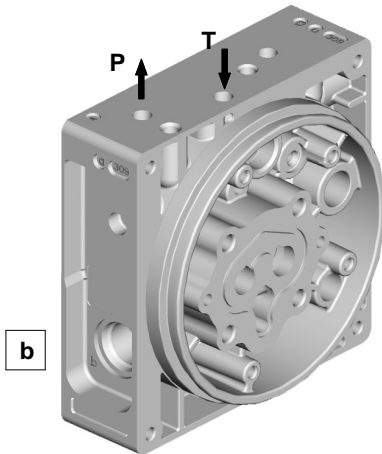
Cavity **b** = 3/4"-16 UNF (check valve cavity)

- **P** = Pressure line for manifolds*
- **T** = Return line T for manifolds*

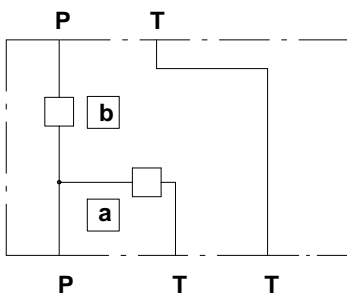
* for manifold see section 8



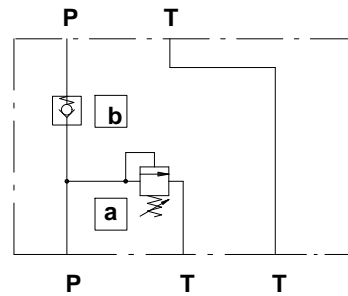
Cavities identification



Basic circuit



Example of standard circuit

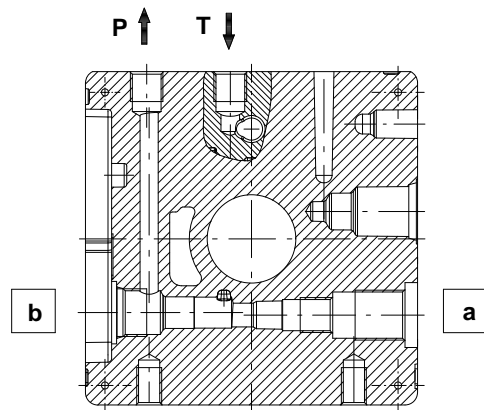


UP100K3**-**

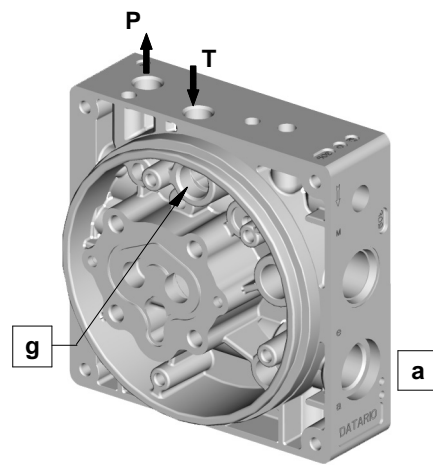
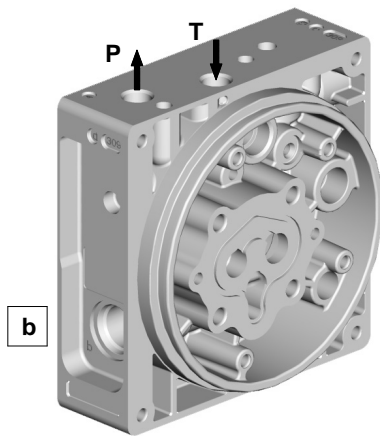
Cavity **a** = M20X1.5 (relief valve cavity)

Cavity **b** = 3/4"-16 UNF (check valve cavity)

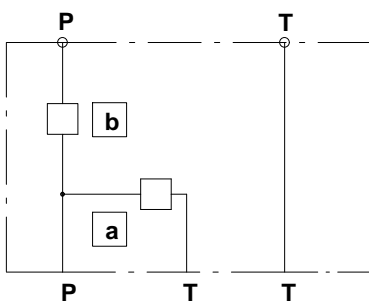
- **P** = Threaded pressure port
- **T** = Threaded return port



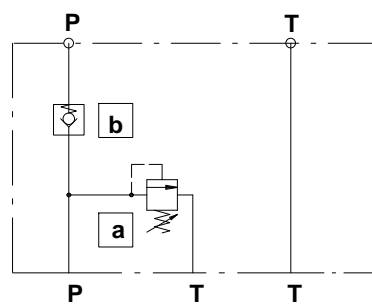
Cavities identification



Basic circuit



Example of standard circuit



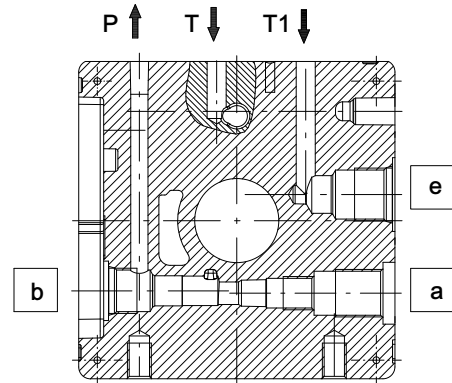
UP100K3P0-02

Cavity **a** = M20X1.5 (relief valve cavity)

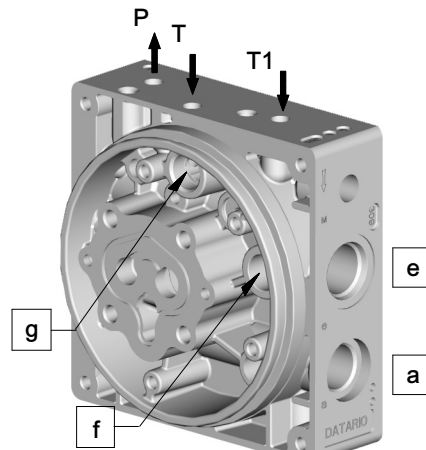
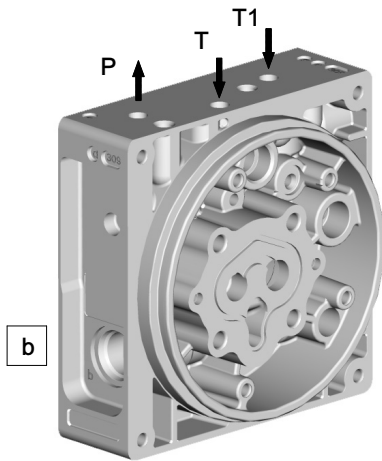
Cavity **b** = 3/4"-16 UNF (check valve cavity)

Cavity **e** = 7/8"-14 UNF (flow regulator cavity)

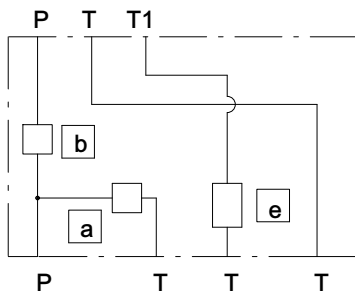
- **P** = Pressure line P for special manifolds
- **T** = Return line T for special manifolds
- **T1** = Secondary return line T1 for special manifolds



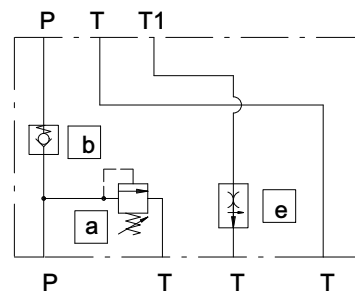
Cavities identification



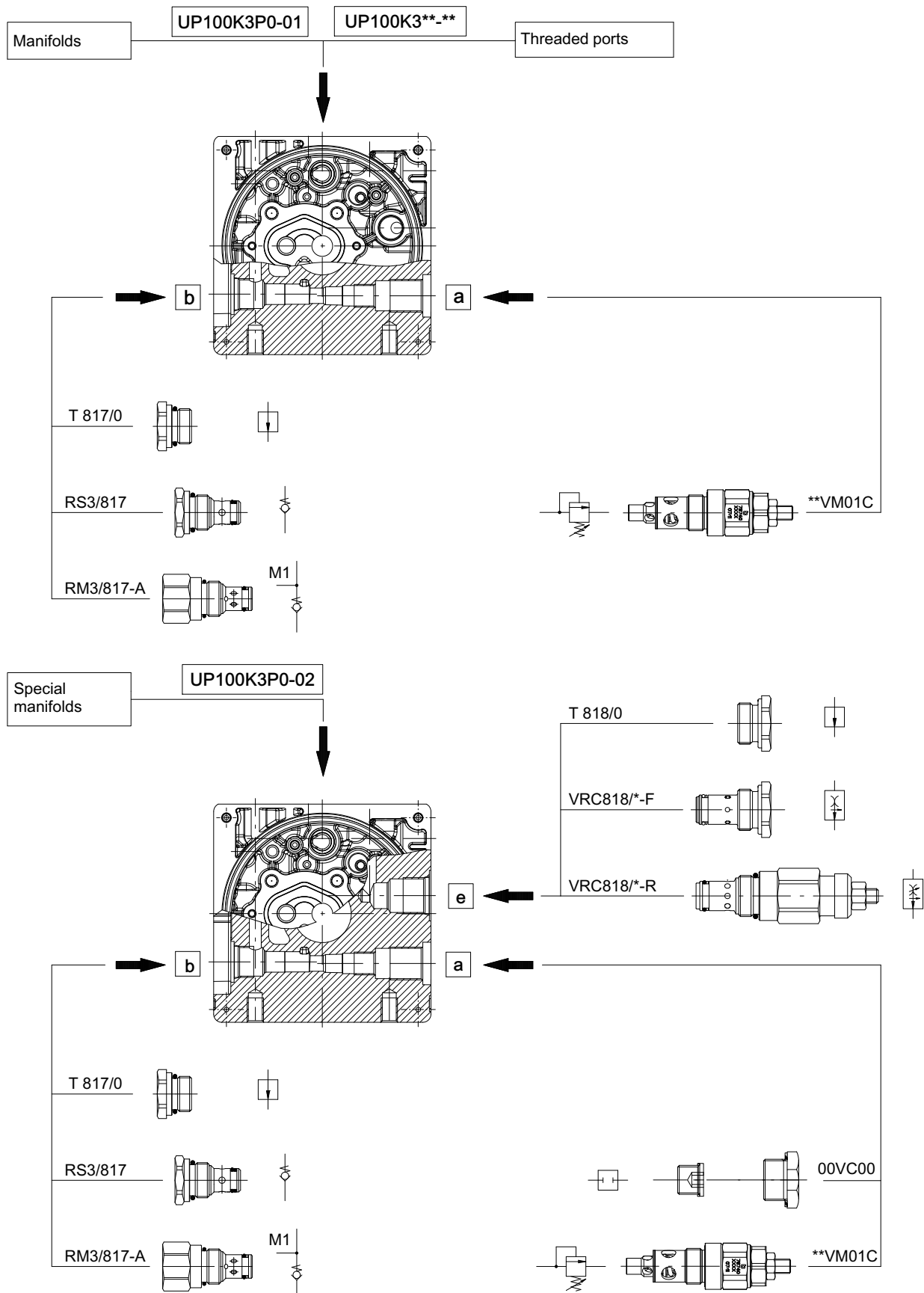
Basic circuit



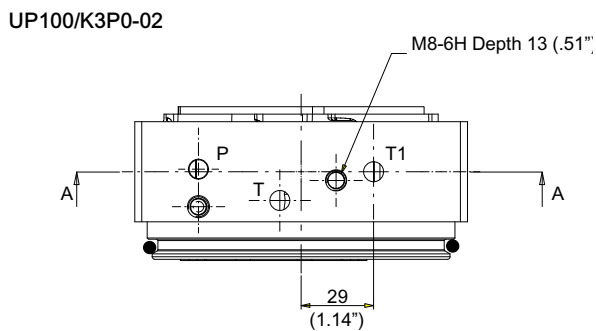
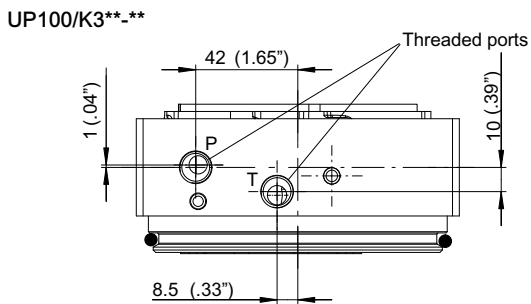
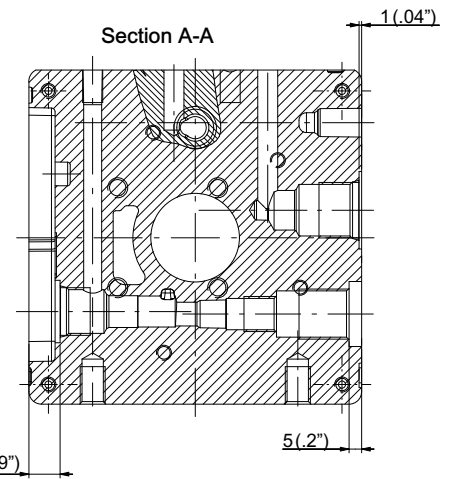
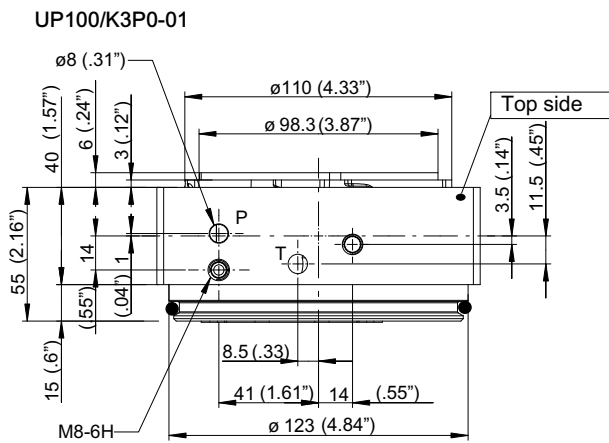
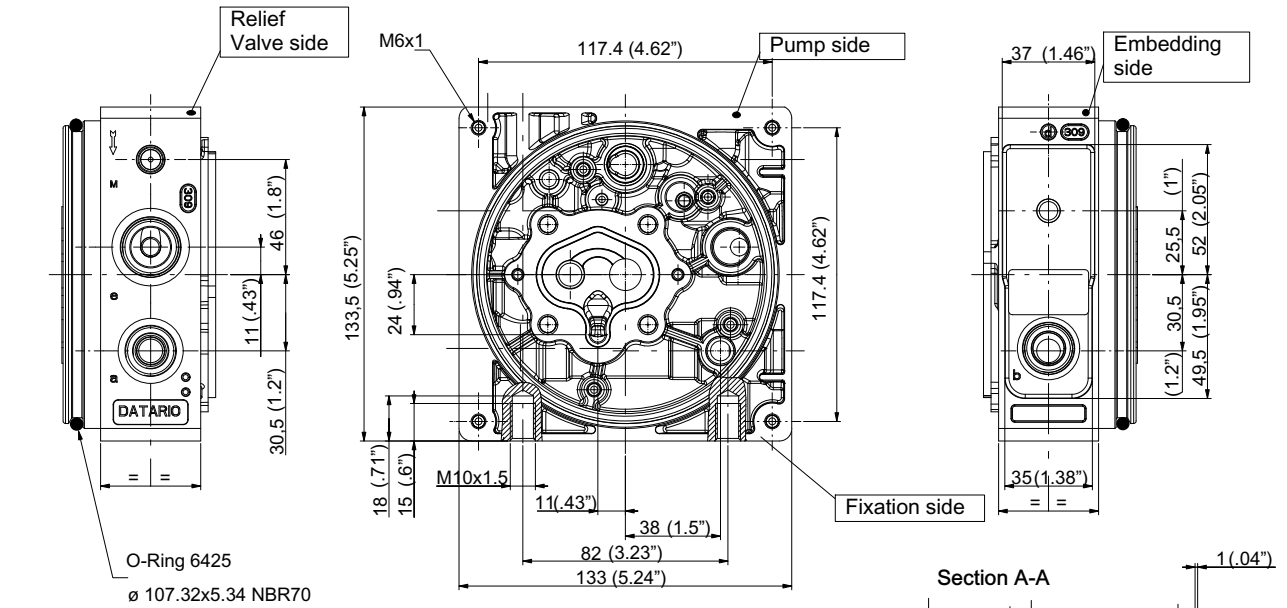
Example of standard circuit



1.3.2 Component accepted by the single cavities



1.3.3 Dimensions



Type	For manifolds
UP100K3P0-01	Section 8 of catalogue

Type	Port P/T
UP100K3G2-01	1/4" BSP
UP100K3M2-01	M14X1.5
UP100K3S2-01	SAE6

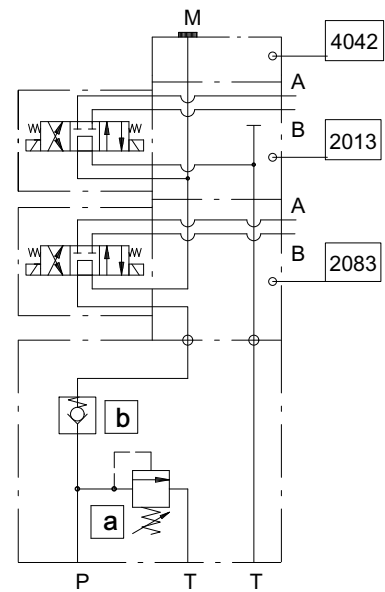
Type	For special blocks
UP100K3P0-02	Section 8 of catalogue

Example

1	Type of housing	Vers.
1	U P 1 0 0 K 3 P 0 - 0 1	

1.3.4 Example for compilation of hydraulic power pack specification form

- UP100 power pack set up for manifolds
- VM01C pressure relief valve set at 210 bar
- RS3/817 check valve.
- combined series manifolds 2083-2013-4042 with assembled two CETOP A-02 solenoid operated directional valves input voltage 24 volt DC.
- * for valves and manifolds see section 7 - 8 .

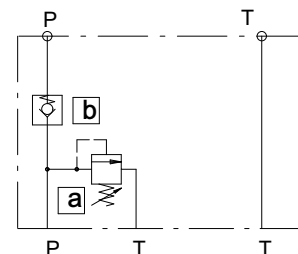


	Type of housing	Vers.
1	U P 1 0 0 K 3 P 0 -	0 1

	Cavity a	Cavity b
7	2 1 V M 0 1 C	R S 3 / 8 1 7

	Sequence	Manifolds	Valves for manifolds	Q.ty	Volt
8	1	2 0 8 3	A - 0 2		2 3
	2	2 0 1 3	A - 0 2		
		4 0 4 2			

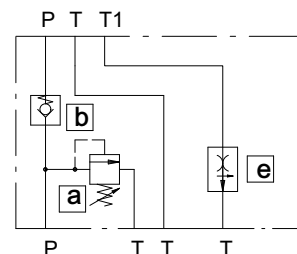
- UP100 power pack set up for direct threaded 1/4" BSP connections P-T.
- VM01C pressure relief valve set at 170 bar
- RS3/817 check valve.



	Type of housing	Vers.
1	U P 1 0 0 K 3 G 2 -	0 1

	Cavity a	Cavity b	Cavity c
7	1 7 V M 0 1 C	R S 3 / 8 1 7	

- UP100 power pack set up for special manifolds.
- VM01C pressure relief valve set at 210 bar
- RS3/817 check valve.
- VRC818/05-F fixed flow control valve fitted in cavity e.



	Type of housing	Vers.
1	U P 1 0 0 K 3 P 0 -	0 2

	Cavity a	Cavity b	Cavity c	Cavity d	Cavity e	Cavity f
7	2 1 V M 0 1 C	R S 3 / 8 1 7				
				V R C 8 1 8 / 0 5 - F		

1.4 Housing UP100K4 (integrated valves + external manifolds)

1.4.1 Main specification

UP100K4G2-01

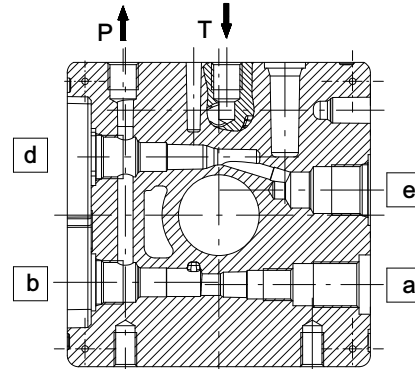
Cavity **a** = M20X1.5 (relief valve cavity)

Cavity **b** = 3/4"-16 UNF (check valve cavity)

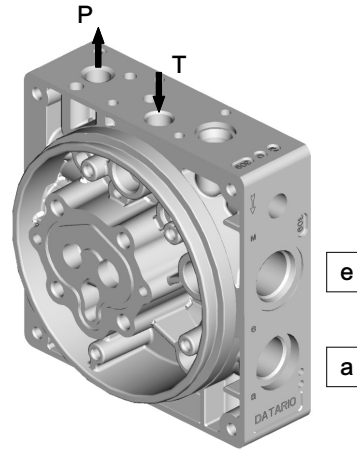
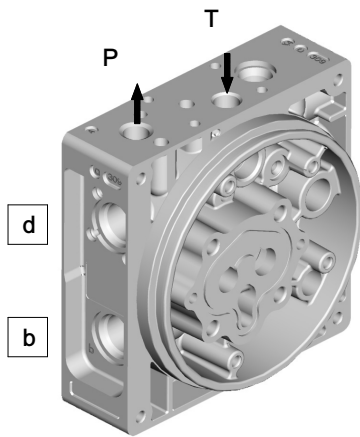
Cavity **d** = 3/4"-16 UNF (directional valve cavity)

Cavity **e** = 7/8"-14 UNF (flow regulator cavity)

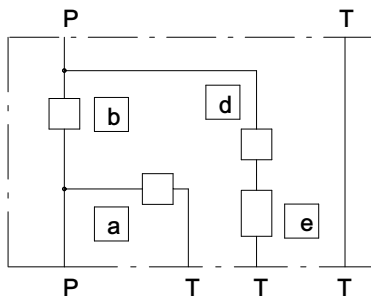
- **P** = Threaded pressure port
- **T** = Threaded return port



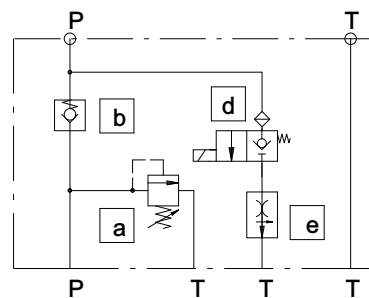
Cavities identification



Basic circuit UP100K4G2-01



Example of standard circuit UP100K4G2-01



UP100K4P0-01

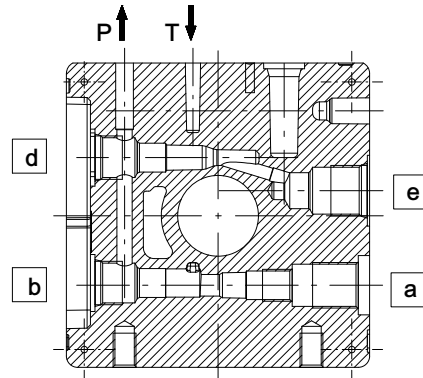
Cavity **a** = M20X1.5 (relief valve cavity)

Cavity **b** = 3/4"-16 UNF (check valve cavity)

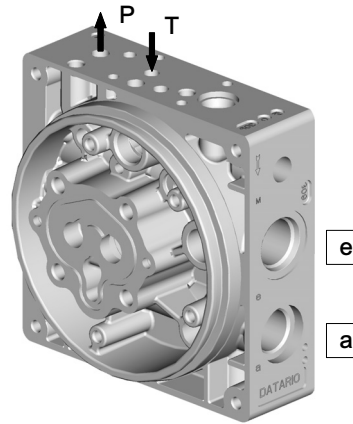
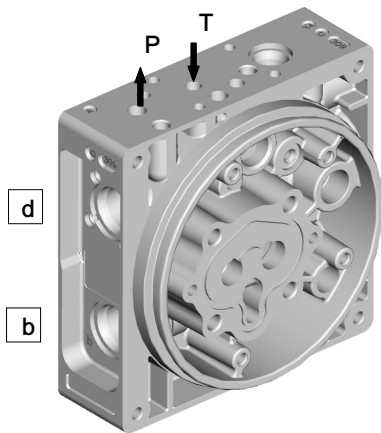
Cavity **d** = 3/4"-16 UNF (directional valve cavity)

Cavity **e** = 7/8"-14 UNF (flow regulator cavity)

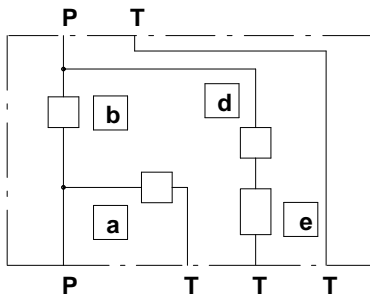
- **P** = Pressure line for manifolds
- **T** = Return line for manifolds



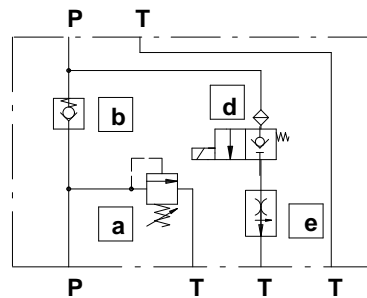
Cavities identification



Basic circuit



Example of standard circuit



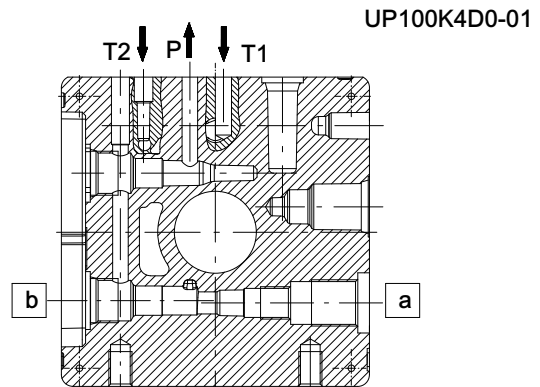
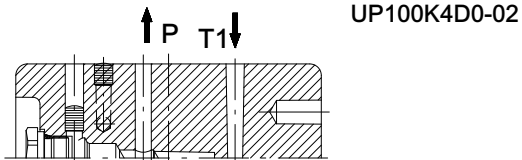
UP100K4D0-01 / UP100K4D0-02

Cavity **a** = M20X1.5 (relief valve cavity)

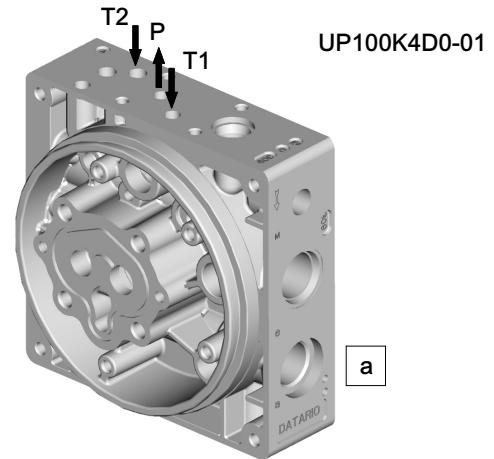
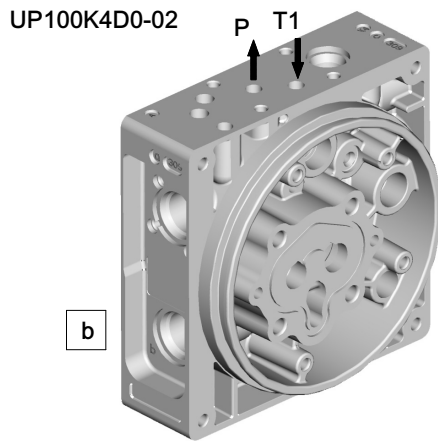
Cavity **b** = 3/4"-16 UNF (check valve cavity)

- **P** = Pressure line for directional valves
- **T1** = Return line for directional valves
- **T2** = Secondary return line T2 for directional valves*
(Plugged in UP100/K4D002 version)

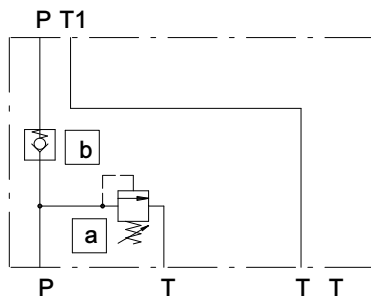
* for directional valves see section 9



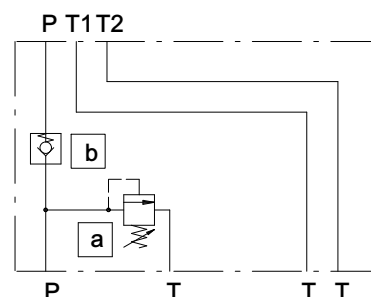
Cavities identification



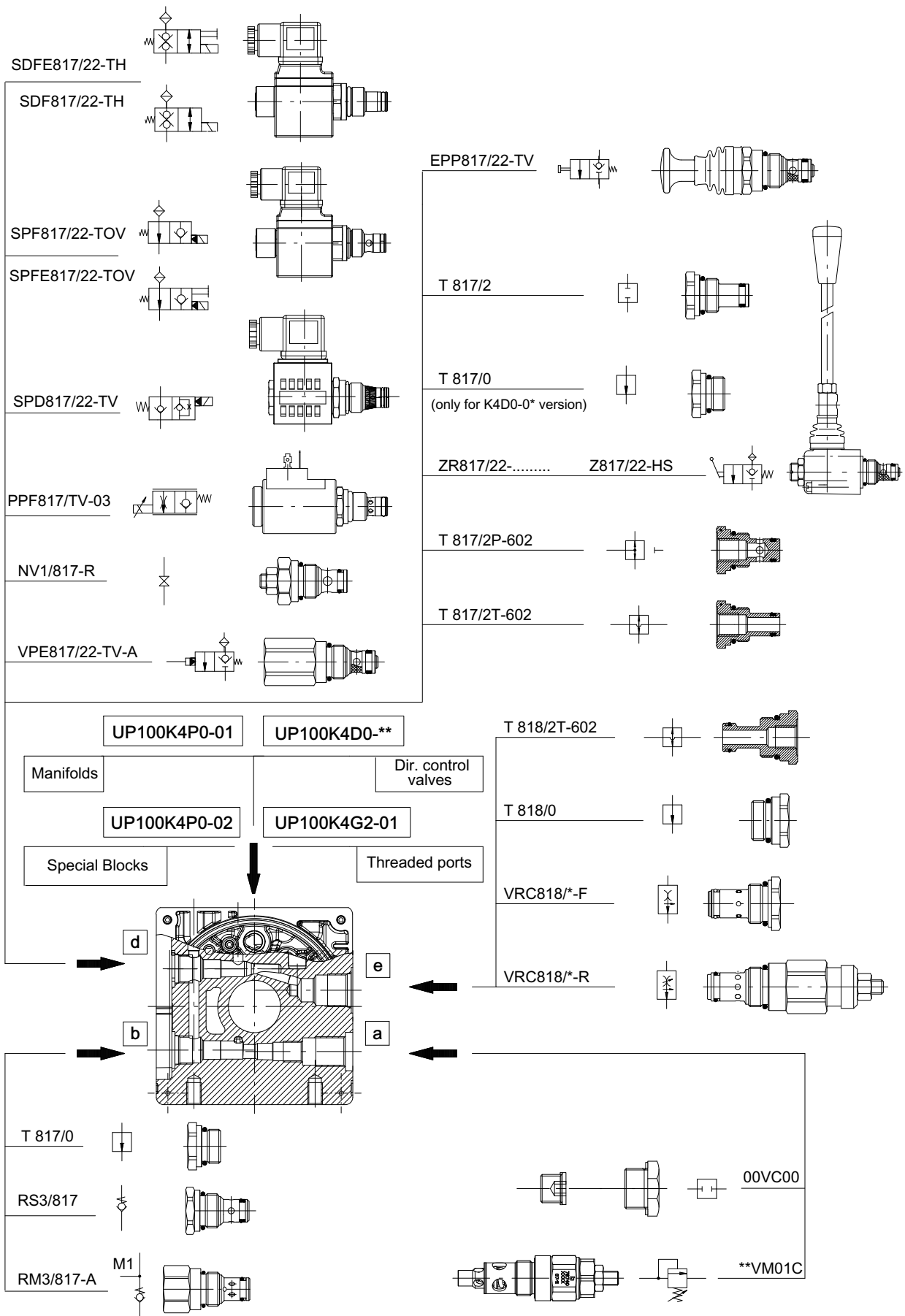
Example of standard circuit
UP100K4D0-02



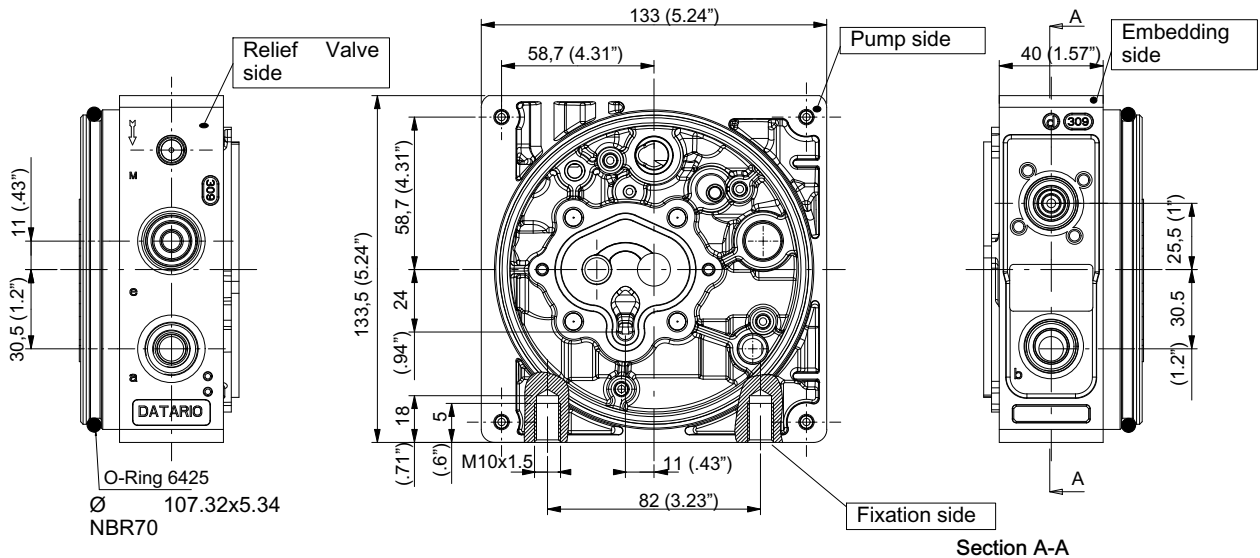
Example of standard circuit
UP100K4D0-01



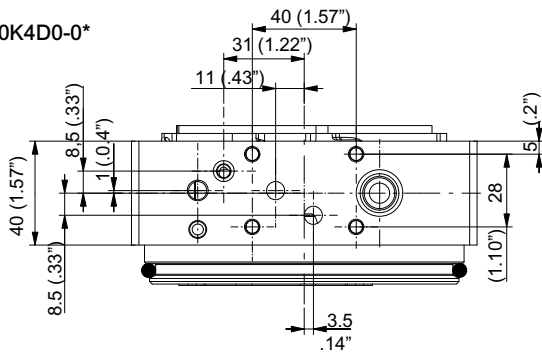
1.4.2 Components accepted by the single cavities



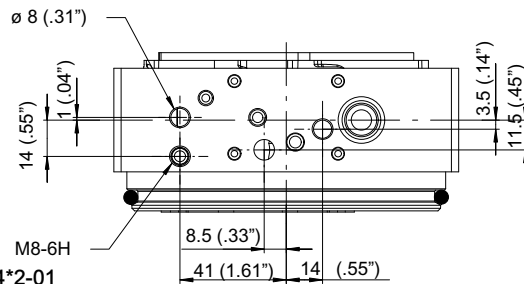
1.4.3 Dimensions



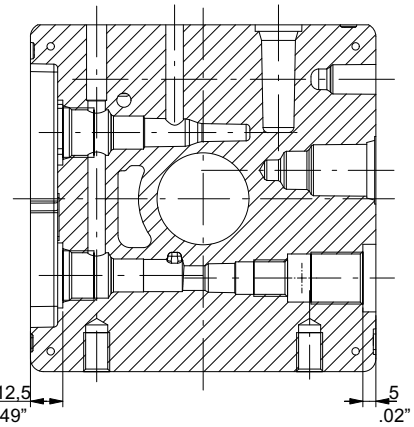
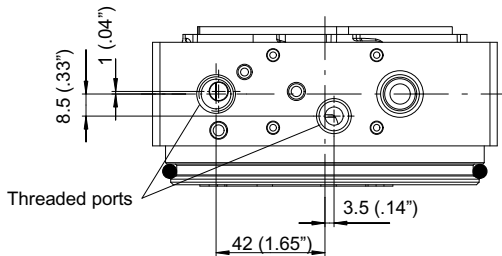
UP100K4D0-0*



UP100K4P0-01



UP100K4*2-01



Type	For manifolds
UP100K4P0-01	Section 8 of catalogue

Type	Port P/T
UP100K4G2-01	1/4" BSP
UP100K4M2-01	M14X1.5
UP100K4S2-01	SAE6

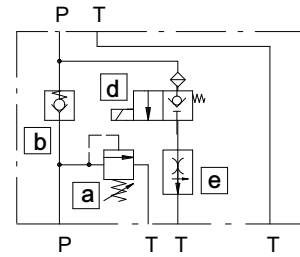
Example

1	Type of housing	Vers.
1	U P 1 0 0 K 4 P 0 -	0 1

Type	For directional control valves
UP100K4D0-01	Plates 4270-4280 for HDS11-HDS07
UP100K4D0-02	HD105-HD106

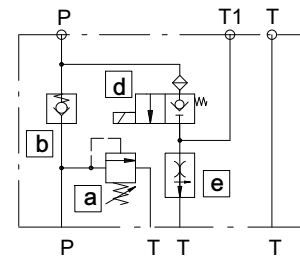
1.4.4 Example for compilation of hydraulic power pack specification form

- UP100 Power pack with integrated valves and prearranged for external manifold
- VM01C pressure relief valve set at 180 bar
- RS3/817 check valve.
- SDF817/22-TH solenoid operated directional valve (12 V. D.C.) fitted in cavity d.
- VDF818/09-F fixed flow control valve fitted in cavity e.



1	Type of housing	Vers.		
	U P 1 0 0 K 4 P 0 - 0 1			
7	Cavity a	Cavity b	Cavity c	
	1 8 V M 0 1 C	R S 3 / 8 1 7		
	Cavity d	Cavity e	Cavity f	
	S D F 8 1 7 / 2 2 - T H	V R C 8 1 8 / 0 9 - F		
	Cavity g	Hand lever	Lever Stick	Volt
				1 3

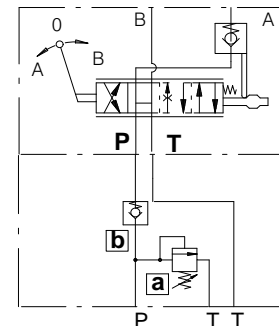
- UP100 power pack with integrated valves and threaded connections P/T= 1/4" BSP and T1= 3/8" BSP.
- VM01C pressure relief valve set at 210 bar
- RS3/817 check valve.
- SDF817/22-TH solenoid operated directional valve (24 volt 50 Hz A.C.).
- VRF818/05-F fixed flow control valve fitted in cavity e.



1	Type of housing	Vers.		
	U P 1 0 0 K 4 G 2 - 0 4			
7	Cavity a	Cavity b	Cavity c	
	2 1 V M 0 1 C	R S 3 / 8 1 7		
	Cavity d	Cavity e	Cavity f	
	S D F 8 1 7 / 2 2 - T H	V R C 8 1 8 / 0 5 - F		
	Cavity g	Hand Lever	Stick Lever	Volt
				2 1

UP100 power pack prearranged for external directional control valves.

- VM01C pressure relief valve set at 210 bar.
- RS3/817 check valve.
- HD106 K02 ADC08 manual operated directional valve fitted on UP100 housing.



1	Type of housing	Vers.				
	U P 1 0 0 K 4 D 0 - 0 2					
7	Cavity a	Cavity b	Cavity c			
	2 1 V M 0 1 C	R S 3 / 8 1 7				
	El. n.	Sectional body valve	Circuit	Posit.	Lever	Hand Lever
9	1	H D 1 0 6 K 0 2	A D C 0 1	L 1 0 0	A L 0 0 1	

1.5 Housing UP100K6 (Single acting)

1.5.1 Main specification

Cavity **a** = M20X1.5 (relief valve cavity)

Cavity **b** = 3/4"-16 UNF (check valve cavity)

Cavity **c** = 3/4"-16 UNF (directional valve cavity)

Cavity **e** = 7/8"-14 UNF (flow regulator cavity)

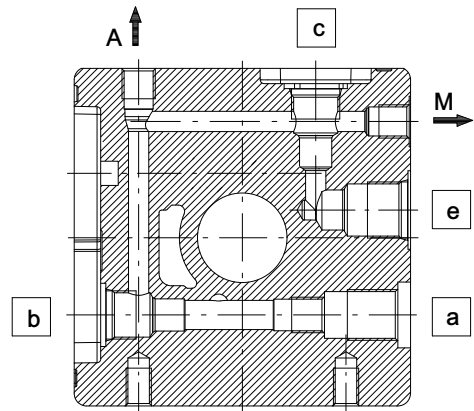
Cavity **f** = return line

- **A** = Main work port

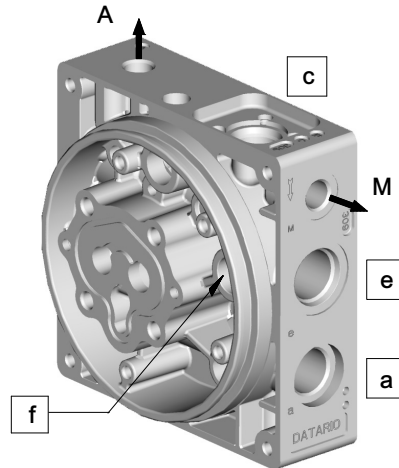
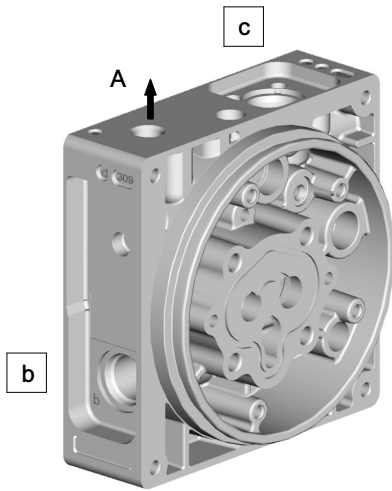
- **M** = Secondary work port

One only possible assembling position for the directional valve

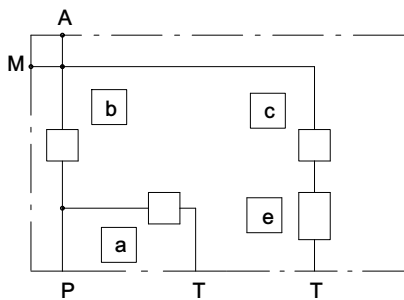
Three possible flow range capacity (8-14-25 lt/1') for the solenoid directional control valve.



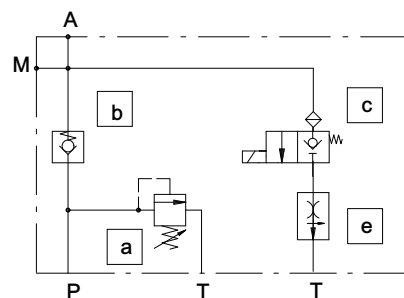
Cavities identification



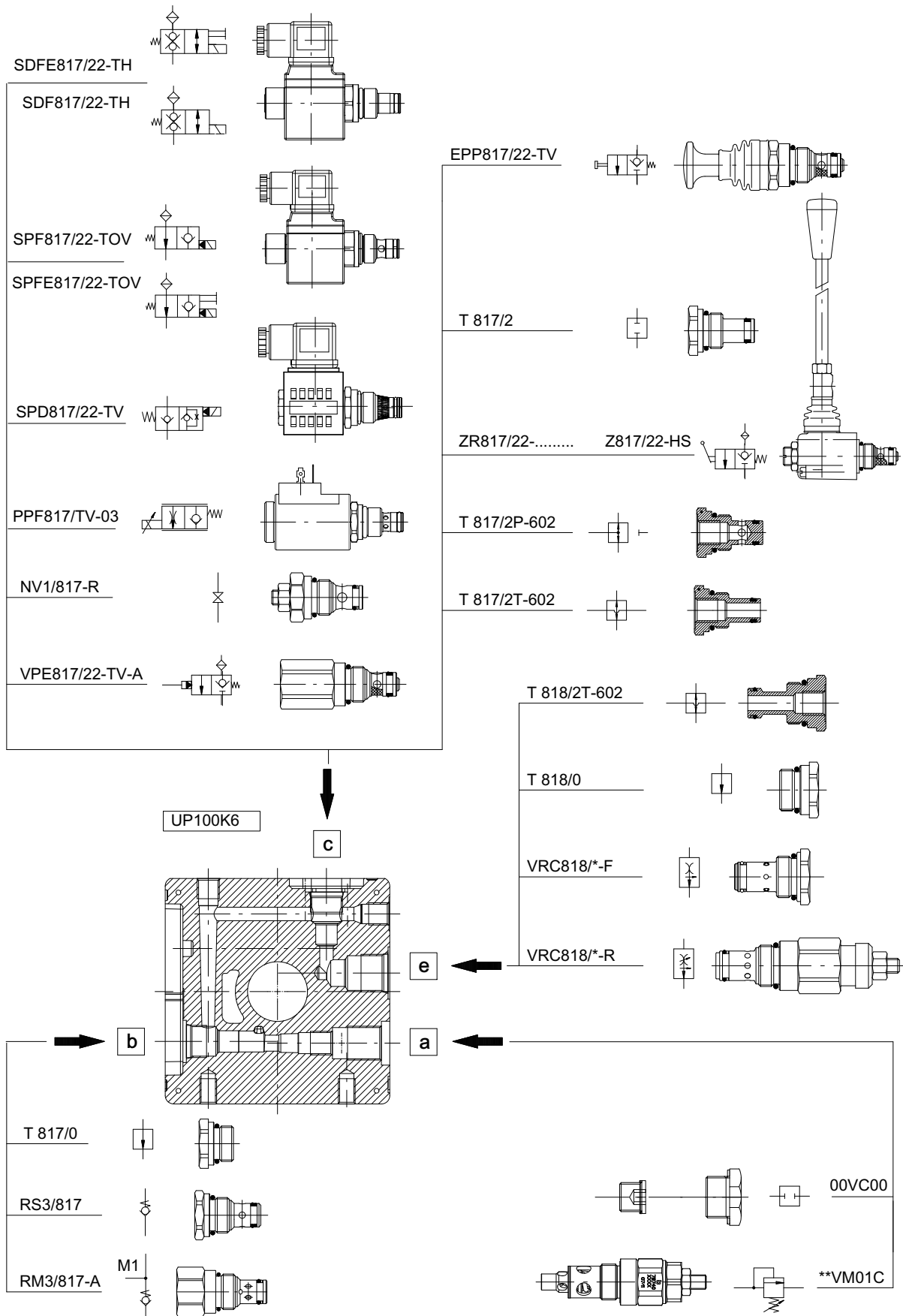
Basic circuit



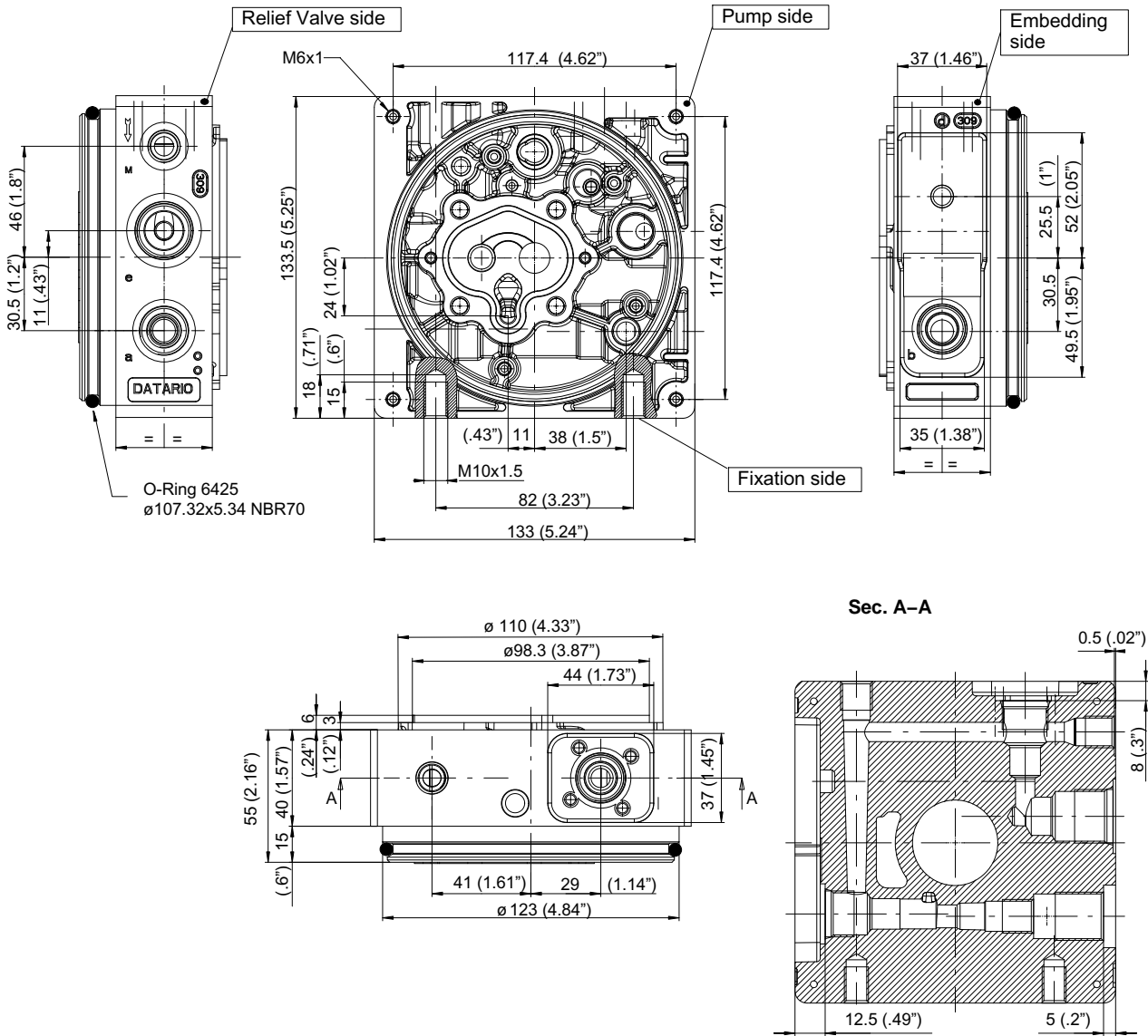
Example of standard circuit



1.5.2 Component accepted by the single cavities



1.5.3 Dimensions



Supplied with port M plugged - Standard Version

Type	Port A	Port M
UP100K6G2-01	1/4" BSP	1/4" BSP

Other versions to order

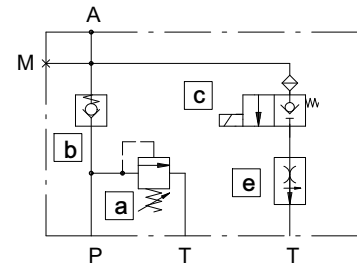
Type	Port A	Port M
UP100K6G3-01	3/8" BSP	1/4" BSP
UP100K6S2-02	SAE6	SAE6

Example

1	Type of housing										Vers.	
	U	P	1	0	0	K	6	G	2	-		0
	U	P	1	0	0	K	6	G	2	-	0	1

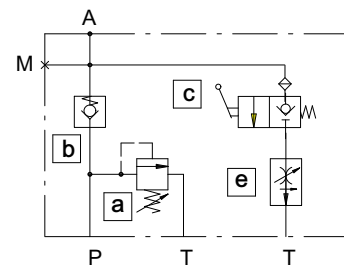
1.5.4 Examples for compilation of hydraulic power pack specification form

- UP100 Power pack set up for single acting circuit.
Main work port A thread 1/4" BSP (secondary work port M threaded 1/4" BSP plugged)
- VM01C pressure relief valve set at 150 bar
- RS3/817 check valve.
- SDF817/22-TH solenoid operated directional valve (12 VDC) fitted in cavity c.
- VRC818/05-F fixed flow control valve fitted in cavity e.



Type of housing		Vers.	
1	U P 1 0 0 K 6 G 2 - 0 1		
7	Cavity a	Cavity b	Cavity c
	1 5 V M 0 1 C	R S 3 / 8 1 7	S D F 8 1 7 / 2 2 - T H
	Cavity d	Cavity e	
		V R C 8 1 8 / 0 5 - F	
	Cavity g	Hand lever	Lever stick
			Volt
			1 3

- UP100 power pack set up for single acting circuit.
Main work port A with 3/8" BSP thread (secondary work port M with 1/4" BSP thread plugged).
- VM01C pressure relief valve set at 180 bar
- RS3/817 check valve.
- ZR817/22-TV manual operated directional valve fitted in cavity c.
- VRC818/B-R adjustable flow control valve fitted in cavity e.



Type of housing		Vers.	
1	U P 1 0 0 K 6 G 3 - 0 1		
7	Cavity a	Cavity b	Cavity c
	1 8 V M 0 1 C	R S 3 / 8 1 7	Z R 8 1 7 / 2 2 - T V
	Cavity d	Cavity e	Cavity f
		V R C 8 1 8 / B - R	
	Cavity g	Hand lever	Lever stick
		L 1 0	A L 0 0 1
			Volt

1.6 Housing UP100K7 (Single acting)

1.6.1 Main specification

Cavity **a** = M20X1.5 (relief valve cavity)

Cavity **c** = 3/4"-16 UNF directional valve

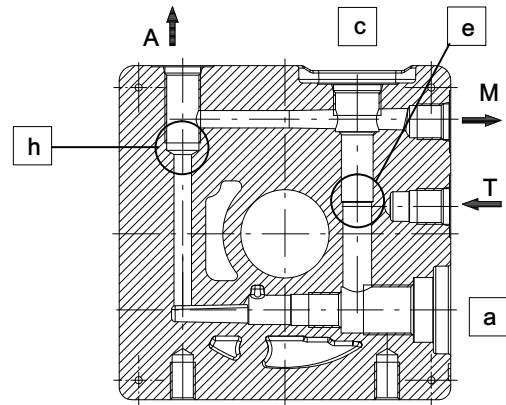
Cavity **e** = the cavity is always machined for flow regulator function. Internal flow regulator valve (fixed setting, only) available, if needed.

Cavity **h** = internal check valve cavity

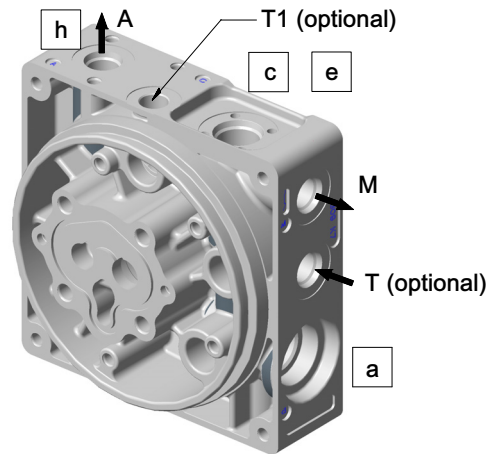
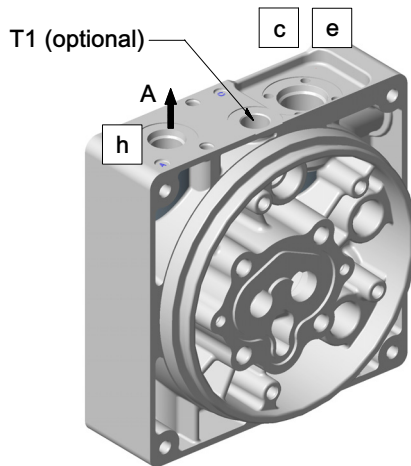
- **A** = Main work port 9/16"-18 UNF
(other threads not possible)
- **M** = Secondary work port 9/16" - 18 UNF
(1/4" BSPP option)
- **T, T1** = return to tank

One only possible assembling position for the directional valve

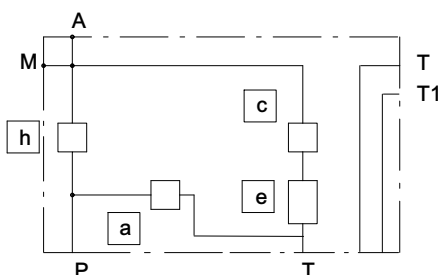
Fixed setting compensated flow control valve available (slip-in shape, **e** cavity).



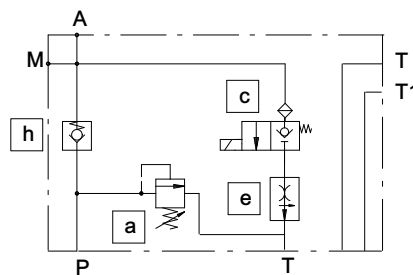
Cavities identification



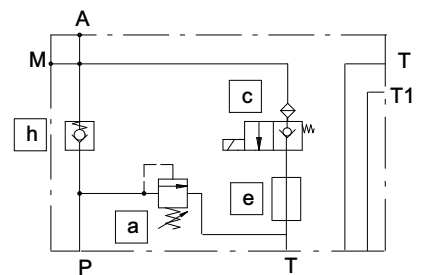
Basic circuit



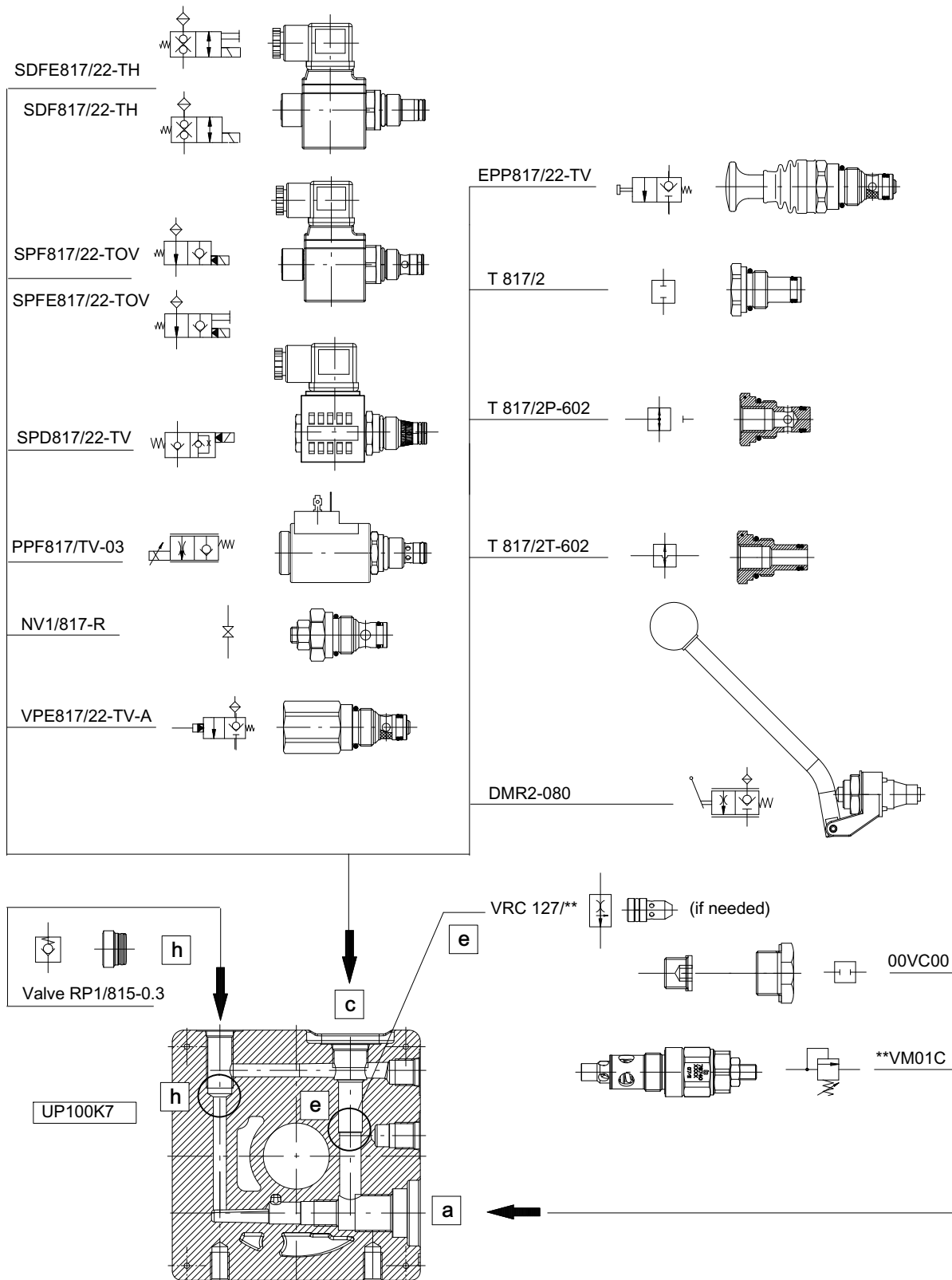
Example of standard circuit with T and T1 return lines



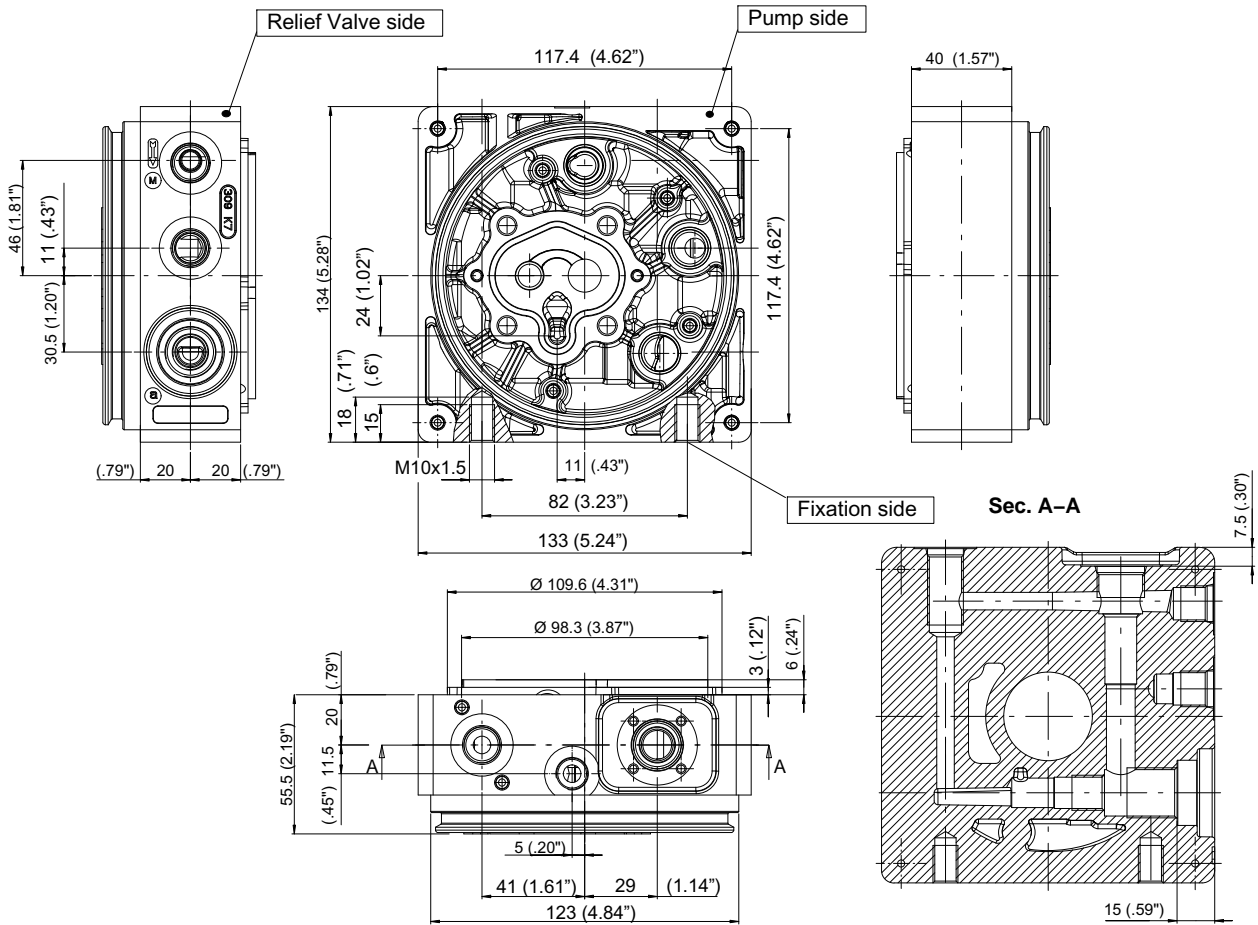
Same example without flow control



1.6.2 Component accepted by the single cavities



1.6.3 Dimensions



Supplied with port M plugged - Standard Version

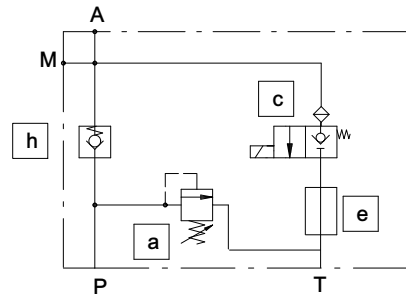
Type	Port A	Port M	Port T	Port T1
UP100K7 S2-00	9/16" - 18 UNF	9/16" - 18 UNF Plugged	1/4" BSPP	9/16" - 18 UNF
UP100K7 S2-02	9/16" - 18 UNF	9/16" - 18 UNF Plugged	-	-

Example

1	Type of housing										Vers.
	U	P	1	0	0	K	7	S	2	-	0

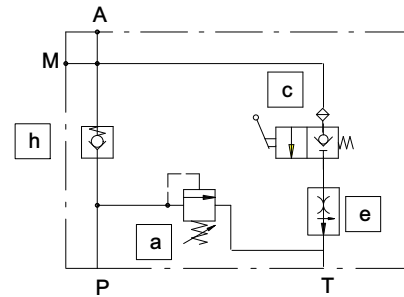
1.6.4 Examples for compilation of hydraulic power pack specification form

- UP100 Power pack set up for single acting circuit.
Main work port A thread 1/4" BSP (secondary work port M threaded 1/4" BSP plugged)
- VM01C pressure relief valve set at 150 bar fitted in cavity a.
- SDF817/22-TH solenoid operated directional valve (12 VDC) fitted in cavity c.
- VRC flow control valve fitted in cavity e.
- RP1/815-03 check valve fitted in cavity h.



1	Type of housing										Vers.												
	U	P	1	0	0	K	7	S	2	-	0	0											
7	Cavity a					Cavity c																	
	1	5	V	M	0	1	C					S	D	F	8	1	7	/	2	2	-	T	H
	Cavity e																						
	Cavity h				Hand lever			Lever stick			Volt												
	R	P	1	/	8	1	5	-	0	3													

- UP100 power pack set up for single acting circuit.
Main work port A with 3/8" BSP thread (secondary work port M with 1/4" BSP thread plugged).
- VM01C pressure relief valve set at 180 bar fitted in cavity a.
- DMR2-080 manual lowering valve fitted in cavity c.
- VRC flow control valve fitted in cavity e.
- RP1/815-03 check valve fitted cavity h.

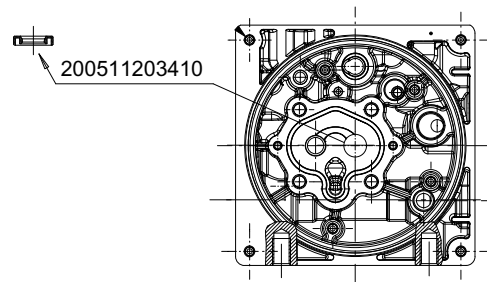


1	Type of housing										Vers.												
	U	P	1	0	0	K	7	S	2	-	0	0											
7	Cavity a					Cavity c																	
	1	8	V	M	0	1	C					D	M	R	2	-	0	8	0				
	Cavity e																						
	Cavity h				Hand lever			Lever stick			Volt												
	R	P	1	/	8	1	5	-	0	3	L	1	0										

1.7 Preassembled housings

The table summarizes part number to be stated in the event that is wished to order the housing sub-assembly fitted with shaft seal only.

Remember that the preassembled housing is supplied without the O-Rings kit, which must be ordered separately.



Preassembled housing K1-K3-K4-K6-K7 with shaft seal

	Body type	Code
K1	UP100 K1G2-01	200740431021
	UP100 K1G3-01	200740431141
	UP100 K1G2-19	200740431471
	UP100 K1M3-01	200740431620
K3	UP100 K3P0-01	200740410531
	UP100 K3P0-02	200740410541
	UP100 K3G2-01	200740420071
	UP100 K3S2-01	200740420101

	Body type	Code
K4	UP100 K4G2-01	200740420111
	UP100 K4P0-01	200740410561
	UP100 K4D0-01	200740440321
	UP100 K4D0-02	200740440370
K6	UP100 K6G2-01	200740431381
	UP100 K6G3-01	200740431391
	UP100 K6S2-02	200740431401
K7	UP100 K7S2-00	200740431690

1.7.1 O-rings kit

O-Rings kit 200974200400 for plastic tank SK01

O-Rings kit 200974200510 for steel tank SK02



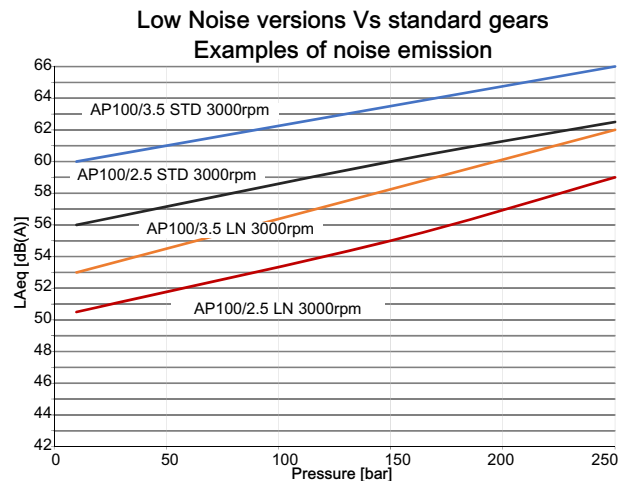
Pump O-Ring

2 Gear pumps

2.1 Technical information

For the maximum flexibility, we can choose from three different type of interchangeable gear pumps:
 S309 = Standard single pumps
 S309LN = Low Noise single pumps (LN)
 S609 = Double pumps
 All these types of gear pumps have the same mechanical and hydraulic interface.
 The Standard (S309) and Low Noise (S309LN) versions have also the same external dimensions

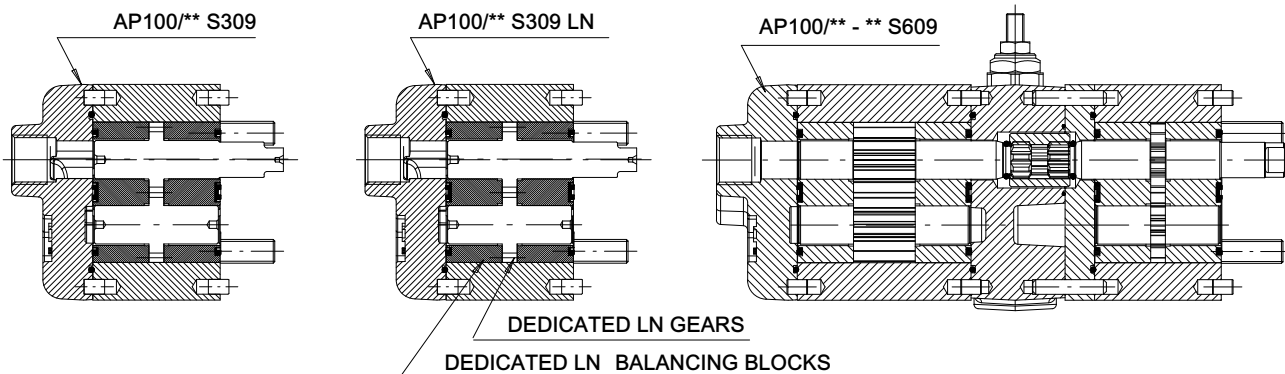
(at the same displacement).
 Note: Low Noise gears have been designed to provide a lower noise level mainly when pump running at medium/high rotation speed (rpm).
 But apart from the numeric values, the real feeling to the human ears is really good if compared to the already excellent standard gears, mainly at medium and low pressure.



2.1.1 Material

Cover: Pressure diecast aluminium alloy
 Intermediate flange for HI-LO pump: gravity diecast aluminium alloy
 Body: Extruded bar aluminium alloy

Gears: Casehardened and aluminium hardened steel.
 Bearings: special antifriction alloy.
 Seals: NBR.



2.1.2 Suitable fluids

Bucher Hydraulics recommends to use a mineral based oil according to type HM (ISO 6743/4) or type HLP (DIN 51524) only.

Viscosity range:
 recommended 20 - 120 mm²/s (cSt)
 admitted up to 400 mm²/s (cSt)
 Operating temperature range: -15/+80 °C (+70° C with plastic tank).
 For other fluids consult our Sales Center.

2.1.3 Inlet

Absolute pressure at the pump inlet must be
 $V > 0.75 \text{ bar (11 PSI)}$

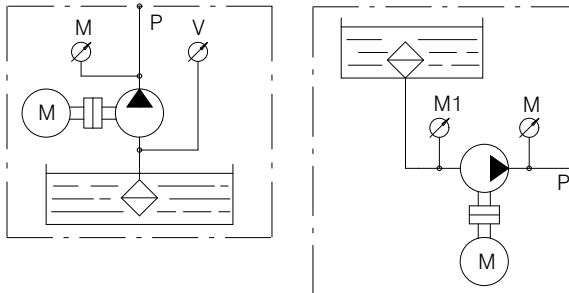
Accordingly, avoid:

- significant differences in height of pump and tank
- long pipeline runs
- sharp bends, restrictions, etc. causing turbulent flow

In certain applications, inlet pressure may be higher than 1 bar (14.3 PSI), or at any rate higher than atmospheric. For pumps with standard configuration, the pressure registering at the gauge M1 should be:
 $M1 < 3.5 \text{ bar (50 PSI)}$.



Attention: Use of pumps at temperatures above 80°C must always be agreed upon with our Technical Office, and in any case this can cause a significant worsening in the volumetric efficiency. For use under conditions different from those indicated in this catalogue, please contact our Sales Center.



2.1.4 Outlet

Pressure levels:

P1 = continuous operating pressure

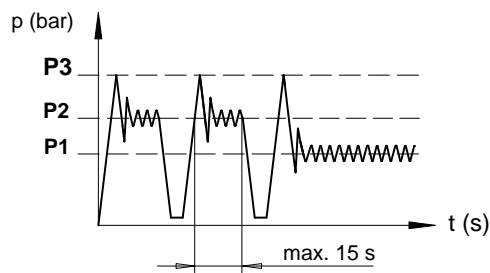
P2 = intermittent operating pressure

P3 = peak pressure

The recommended delivery pipe oil speed is between:

$v = 2 - 5 \text{ m/s}$

In the next pages are indicated the performances for each pump.



Example of the values in the table

AP100 Pump type	Displacement		L		Max pressure						n min.	n max.
	cm ³ /rev	Cu.In. P.R.	mm	inch.	P1		P2		P3			
AP100/2.5 S309	2.5	.152	86.4	3.40	210	3000	230	3300	250	3600	650	5000

2.1.5 Calculating the specifications of a gear pump

The equations for calculating the following parameters are given below:

$V_c = (\text{cm}^3/\text{g})$ pump displacement;

$n = (\text{g}/\text{min})$ Drive shaft rpm;

$Q = (\text{l}/\text{min})$ flow rate;

$P = (\text{bar})$ Operating pressure;

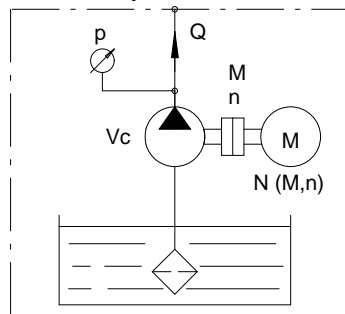
$M = (\text{Nm})$ Torque;

$N = (\text{kW})$ Power

$\eta_v = (\%)$ Volumetric efficiency

$\eta_m = (\%)$ Mechanical efficiency

$\eta_t = (\%)$ Total efficiency



$$Q = \frac{V_c \cdot n}{100000} \cdot \eta_v$$

$$V_c = \frac{100000 \cdot Q}{n \cdot \eta_v}$$

$$n = \frac{100000 \cdot Q}{V_c \cdot \eta_v}$$

$$N = \frac{V_c \cdot n \cdot p}{6120 \cdot \eta_m}$$

$$N = \frac{Q \cdot p}{6.12 \cdot \eta_t}$$

$$p = \frac{N \cdot 6.12 \cdot \eta_t}{Q}$$

$$p = \frac{N \cdot 6120 \cdot \eta_m}{V_c \cdot n}$$

$$M = 9555 \cdot \frac{N}{n}$$

$$\eta_t = \eta_v \cdot \eta_m$$

Example

AP100/2.5 $V_c = 2.5 \text{ cm}^3/\text{r}$ $n = 1500 \text{ r}/\text{min}$ $p = 200 \text{ bar}$ $\eta_v = 94\%$ $\eta_m = 87\%$

$$Q = \frac{2.5 \cdot 1500}{100000} \cdot 94 = 3.52 \text{ l}/\text{min.}$$

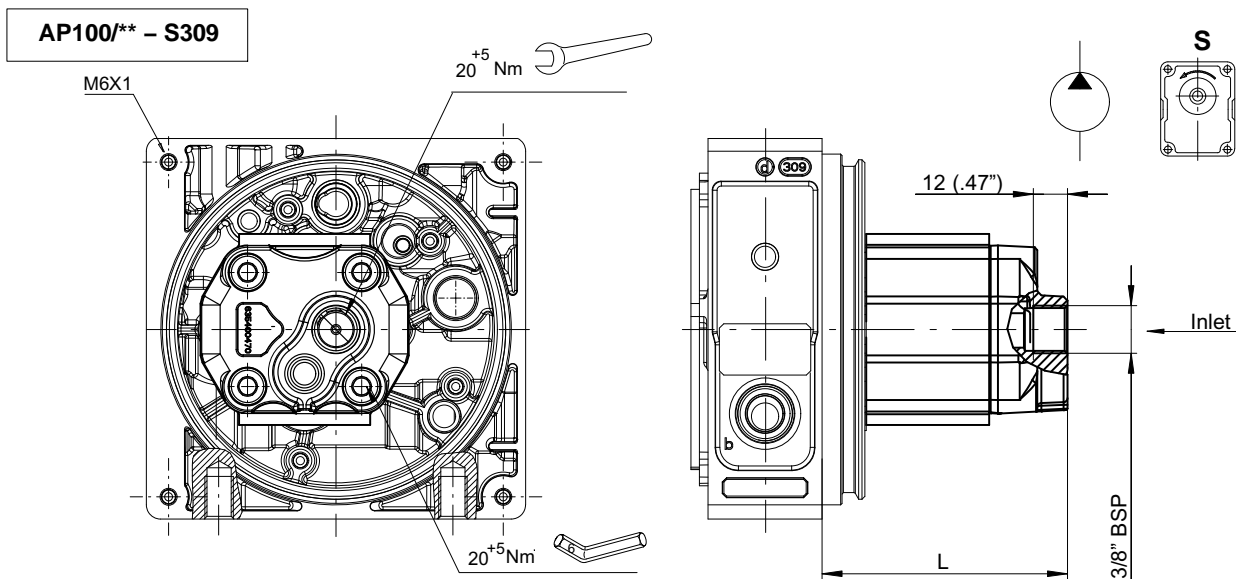
$$\eta_t = 0.94 \cdot 0.87 = 0.82 = 82\%$$

$$N = \frac{3.52 \cdot 200}{6.12 \cdot 82} = 1.4 \text{ kW}$$

$$M = 9555 \cdot \frac{1.4}{1500} = 9 \text{ Nm}$$

2.2 Single unidirectional pumps - Counterclockwise rotation

2.2.1 Standard single pump AP100



Example	Pump										Hi-Lo	Series			
2	A	P	1	0	0	/	2	,	5			S	3	0	9

O-Ring replacement kit: 200974001450

Displacement		AP100 Pump type	Order code	L		Max. pressure						n. min.	n. max
cm ³ /rev	Cu.In-P.R.			mm	inch	P1		P2		P3			
1.2	.073	AP100/1.2 S309	200748210270	86.1	3.39	230	3330	250	3620	280	4060	800	5000
1.7	.103	AP100/1.7 S309	200748220230	88.1	3.47	230	3330	250	3620	280	4060	650	5000
2.5	.152	AP100/2.5 S309	200748230340	91.4	3.60	230	3330	250	3620	280	4060	650	5000
3.5	.213	AP100/3.5 S309	200748240240	95.7	3.77	230	3330	250	3620	280	4060	650	4000
4.3	.262	AP100/4.3 S309	200748250160	99.3	3.91	230	3330	250	3620	270	3910	550	4000
5.0	.305	AP100/5 S309	200748260230	102.1	4.02	220	3190	230	3330	250	3620	500	3500
6.5	.396	AP100/6.5 S309	200748270260	107.1	4.22	220	3190	230	3330	250	3480	500	3000
7.8	.476	AP100/8 S309	200748280130	112.7	4.44	190	2750	210	3040	230	3330	500	3000
10	.610	AP100/10 S309	200748290800	121.8	4.79	160	2320	180	2610	200	2900	500	2500

2.2.2 Heavy usage (Run-in @ 270 bar) for limited duty service

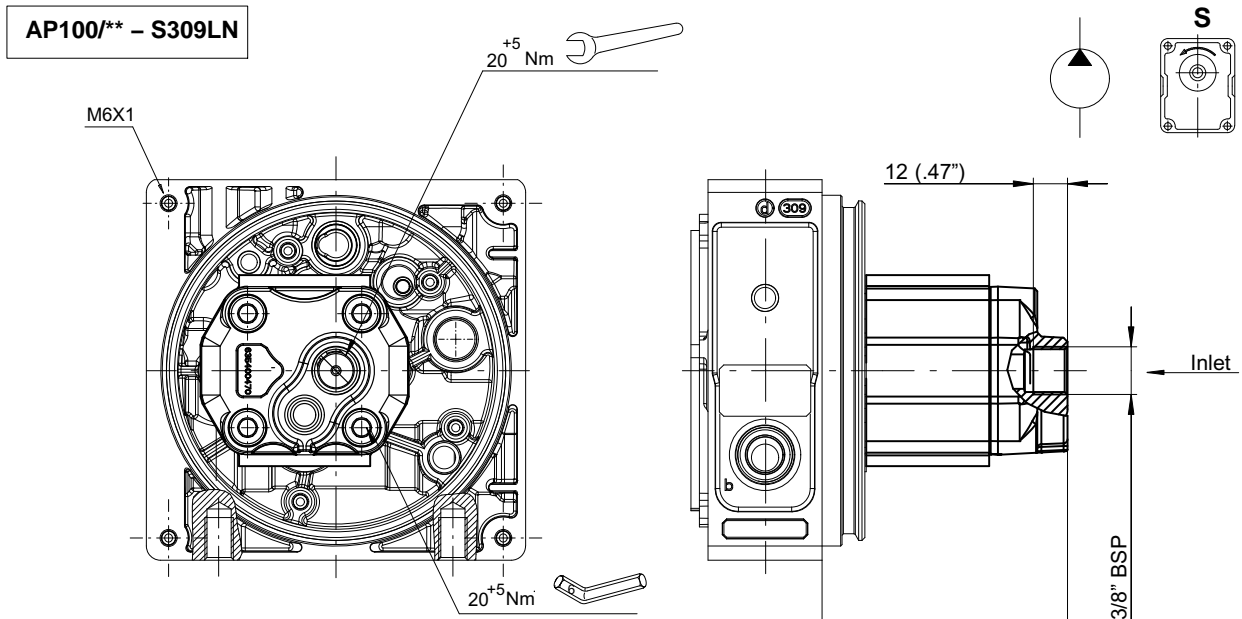
Displacement		AP100 Pump type	Order code
cm ³ /rev	Cu.In-P.R.		
1.2	.073	AP100/1.2 S309	200748210340
1.7	.103	AP100/1.7 S309	200748220310
2.5	.152	AP100/2.5 S309	200748230410
3.5	.213	AP100/3.5 S309	200748240320
4.3	.262	AP100/4.3 S309	200748250220
5.0	.305	AP100/5 S309	200748260280
6.5	.396	AP100/6.5 S309	200748270320
7.8	.476	AP100/8 S309	200748280180
10	.610	AP100/10 S309	200748290850



Attention: Use of pumps at temperatures above 80°C must always be agreed upon with our Technical Office, and in any case this can cause a significant worsening in the volumetric efficiency.

Heavy usage pumps should be utilized just for short time duty service applications and for a limited number of cycles. Please contact our sales office for more information

2.2.3 Low Noise single pump AP100 LN



⚠ The pump series S309LN has fixing screws 5 mm longer compared to the previous used for the S409 series. Take care to use the right screws type and lock them at the right above setting torque value.

Example

O-Ring replacement kit: 200974001450

2	Pump					Hi-Lo	Series									
A	P	1	0	0	/	2	,	5			S	3	0	9	L	N

Displacement		AP100		Order code	L		Max. pressure						n. min.	n. max
cm ³ /rev	Cu.In-P.R.	Pump type			mm	inch	P1		P2		P3			
1.2	.073	AP100/1.2 S309LN	200748210430	86.1	3.39	230	3330	250	3620	280	4060	800	5000	
1.7	.103	AP100/1.7 S309LN	200748220440	88.1	3.47	230	3330	250	3620	280	4060	650	5000	
2.5	.152	AP100/2.5 S309LN	200748230600	91.4	3.60	230	3330	250	3620	280	4060	650	5000	
3.5	.213	AP100/3.5 S309LN	200748240490	95.7	3.77	230	3330	250	3620	270	3910	650	4000	
4.3	.262	AP100/4.3 S309LN	200748250340	99.3	3.91	230	3330	250	3620	270	3910	550	4000	



Attention: Use of pumps at temperatures above 80°C must always be agreed upon with our Technical Office, and in any case this can cause a significant worsening in the volumetric efficiency.

For use under conditions different from those indicated in this catalogue, please contact our Sales Center.

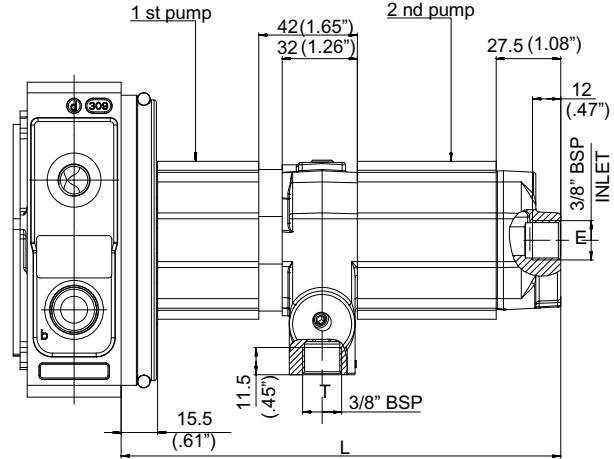
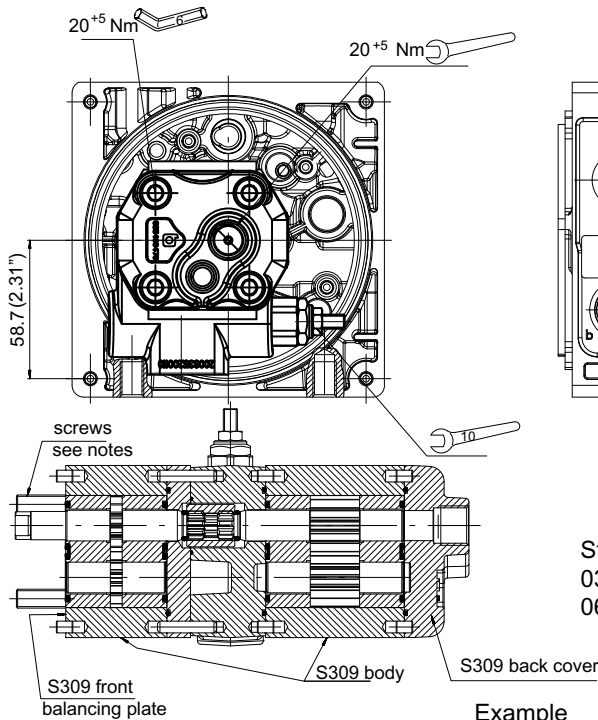
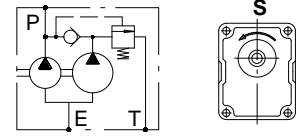
For other displacements availability, please contact our Sales Center.

2.3 Double pumps with HI-LO valve - Counterclockwise rotation



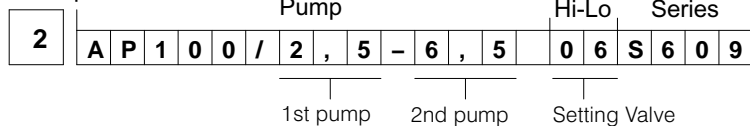
The pump series S609 has fixing screws 5 mm longer compared to the previous used for the S509 series. Take care to use the right screws type and lock them at the right below setting torque value.

AP100/** - **S609



Standard setting values for HI-LO valve
 03 = 30 bar (spring with adjustment range from 15 - 55 bar)
 06 = 60 bar (spring with adjustment range from 55 - 90 bar)

Example



O-Ring replacement kit: 200974001431

1st Pump		2nd Pump		AP100		L Dimension		Existing code		
cm ³ /rev	Cu. In. P.R.	cm ³ /rev	Cu. In. P.R.	1st Pump	2nd Pump	mm	inch	Order code	Description	Pressure Setting (bar)
1.2	.073	4.3	.262	AP100/1.2	AP100/4.3	184.5	7.26	200111194314	AP100/1,2-4,3.03 S609	30
1.2	.073	5.0	.305	AP100/1.2	AP100/5	187	7.36	200111194311	AP100/1,2-5,0.08 S609	80
1.2	.073	6.5	.396	AP100/1.2	AP100/6.5	192	7.56			
1.2	.073	7.8	.476	AP100/1.2	AP100/8	198	7.80	200111194312	AP100/1,2-8,0.03 S609	30
1.7	.103	4.3	.262	AP100/1.7	AP100/4.3	186.5	7.34			
1.7	.103	5.0	.305	AP100/1.7	AP100/5	189	7.44	200111294309	AP100/1,7-5,0.06 S609	60
1.7	.103	6.5	.396	AP100/1.7	AP100/6.5	194	7.64			
1.7	.103	7.8	.476	AP100/1.7	AP100/8	200	7.87			
2.5	.153	4.3	.262	AP100/2.5	AP100/4.3	189.5	7.46			
2.5	.153	5.0	.305	AP100/2.5	AP100/5	192.5	7.58			
2.5	.153	6.5	.396	AP100/2.5	AP100/6.5	197.5	7.78			
2.5	.153	7.8	.476	AP100/2.5	AP100/8	203	7.99	200111394308	AP100/2,5-8,0.05 S609	50
3.5	.215	5.0	.305	AP100/3.5	AP100/5	197	7.76			
3.5	.215	6.5	.396	AP100/3.5	AP100/6.5	202	7.95	200111494312	AP100/3,5-6,5.06 S609	60
3.5	.215	7.8	.476	AP100/3.5	AP100/8	207.5	8.17			

N.B.: Please contact our Sales Center if even one of the operating limits indicated in the tables above (temperature, pressure, rpm) is exceeded, as well as in the case of two or more maximum values at the same time, or for applications with particularly heavy-duty cycles.

Note (*): For availability of pumps without ordering code please contact our Sales Center.

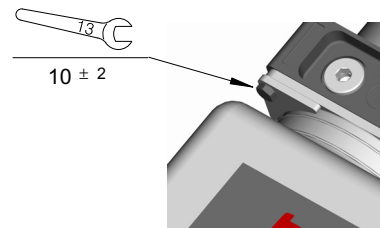
3 Tanks

Tanks supplied by Bucher Hydraulics S.p.A. are classified in two families, according to the material used in manufacture:

3.1 Plastic tanks

3.2 Metal tanks

For both following our fixing system



For the correct number of fixing bracket, bracket spacers and fixing bolts, see "Notes of fitment" of each Tank families

3.1 Plastic tanks

3.1.1 Technical information

Material: Polypropylene (PP)

Color: neutral, translucent allowing visual check on the oil level

Operating temperature range: -15 / +70°C

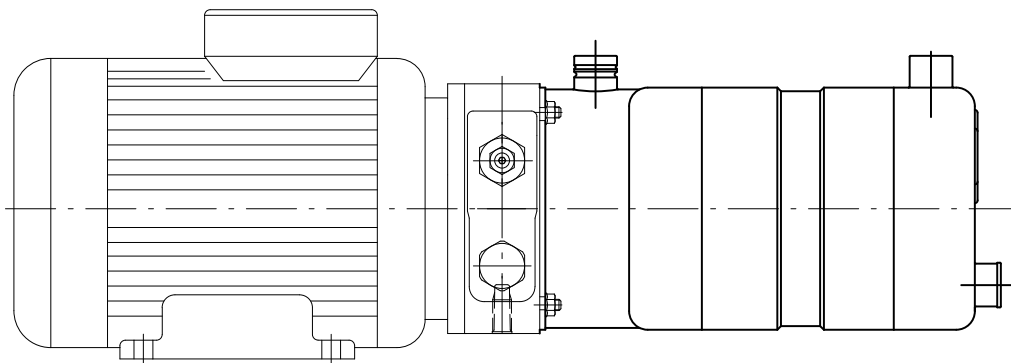
Suitable fluids: use only mineral oil based hydraulic fluids responding to ISO - DIN standards.

Hydrocarbon based fluids (e.g. benzene, benzol, etc.) must not be used. Contamination levels must be no higher than class 20/18/15 as prescribed by ISO 4406.

Versions: Tank are available in numerous versions, allowing installation of the power pack in different horizontal and vertical positions.



Attention: Whilst the fixing and sealing systems are designed for operation under the most heavy-duty conditions, the tank must be securely anchored when fitted to mobile equipment, and when subject to shocks and heavy vibrations generally, by means of flexible clips located in the recesses provided. Care must be taken never to stress and deform the tank when tightening the anchorages.



Guideline capacity values:

Two capacity values are defined:

- Filling capacity:

The quantity of oil that the tank is able to hold, allowing for the volume occupied by the pump and the suction assembly kit.

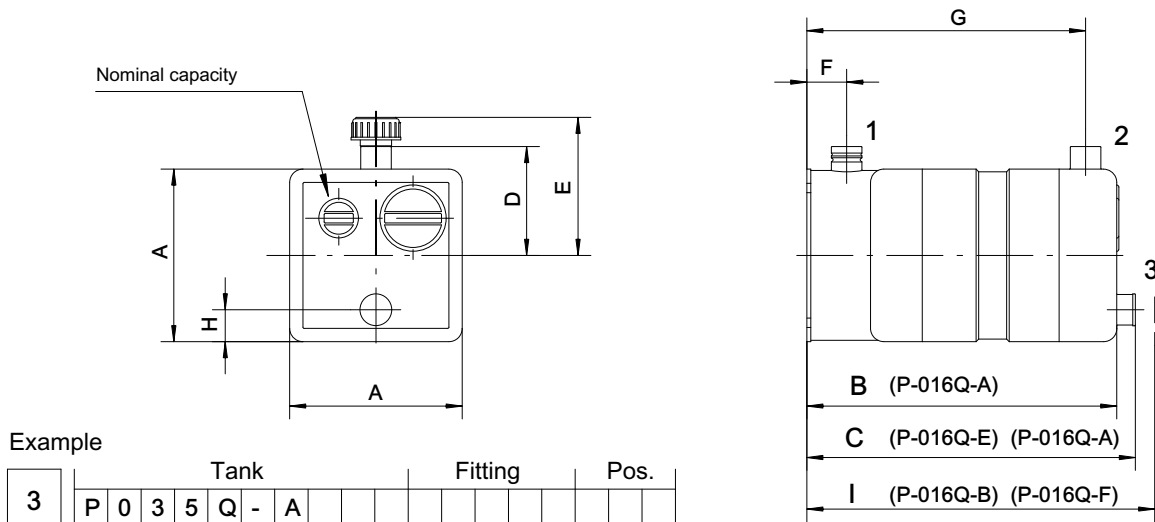
- Suction capacity:

the maximum quantity of the oil the pump is able to draw, hence the quantity of the oil that effectively can be used.

The values given in the table relate to an AP100/1.7 pump with its standard suction assembly kit.

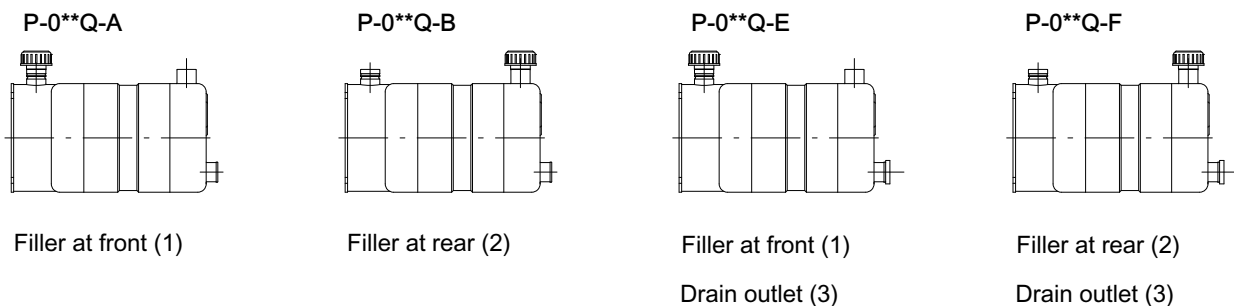
A tolerance of $\pm 5\%$ is allowed on the values indicated.

3.1.2 Square tanks from 1.5 to 3.5 litres



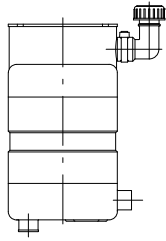
Nom Cap	Type	Code	A		B		C		D		E		F		G		H		I	
			mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
1.5 L	P-015Q-A	200973410020	130	5.2	132	5.2	145	5.7	82	3.3	104	4.1	30	1.2	107	4.3	24	1.0		
1.5 L	P-015Q-B	200973410030	130	5.2	132	5.2	145	5.7	82	3.3	104	4.1	30	1.2	107	4.3	24	1.0		
1.5 L	P-015Q-E	200973410060	130	5.2	132	5.2	145	5.7	82	3.3	104	4.1	30	1.2	107	4.3	24	1.0	150	5.9
1.5 L	P-015Q-F	200973410070	130	5.3	132	5.2	145	5.7	82	3.3	104	4.1	30	1.2	107	4.3	24	1.0	150	5.9
1.6 L	P-016Q-A	200973490010	130	5.3	150	5.9			82	3.3	104	4.1	30	1.2				1.0		
2.5 L	P-025Q-A	200973420020	130	5.3	235	9.3	248	9.8	82	3.3	104	4.1	30	1.2	210	8.3	24	1.0		
2.5 L	P-025Q-B	200973420030	130	5.3	235	9.3	248	9.8	82	3.3	104	4.1	30	1.2	210	8.3	24	1.0		
2.5 L	P-025Q-E	200973420060	130	5.3	235	9.3	248	9.8	82	3.3	104	4.1	30	1.2	210	8.3	24	1.0	253	10.0
2.5 L	P-025Q-F	200973420070	130	5.3	235	9.3	248	9.8	82	3.3	104	4.1	30	1.2	210	8.3	24	1.0	253	10.0
3.5 L	P-035Q-A	200973430020	130	5.3	300	11.8	313	12.3	82	3.3	104	4.1	30	1.2	275	10.8	24	1.0		
3.5 L	P-035Q-B	200973430030	130	5.3	300	11.8	313	12.3	82	3.3	104	4.1	30	1.2	275	10.8	24	1.0		
3.5 L	P-035Q-E	200973430060	130	5.3	300	11.8	313	12.3	82	3.3	104	4.1	30	1.2	275	10.8	24	1.0	318	12.5
3.5 L	P-035Q-F	200973430070	130	5.3	300	11.8	313	12.3	82	3.3	104	4.1	30	1.2	275	10.8	24	1.0	318	12.5

Horizontal mounting



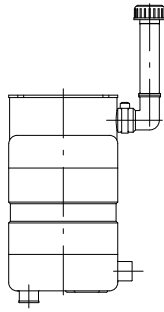
Vertical mounting

P-0**Q-A L30



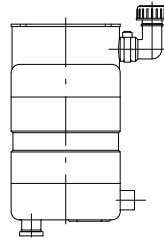
Filler at front (1)
L= 30 fitting (1)

P-0**Q-A L115



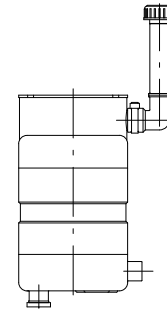
Filler at front (1)
L= 115 fitting (1)

P-0**Q-E L30



Filler at front (1)
L= 30 fitting (1)
Drain outlet (3)

P-0**Q-E L115

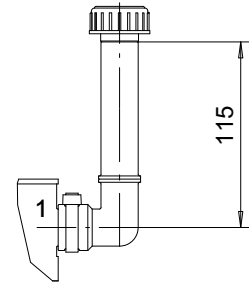
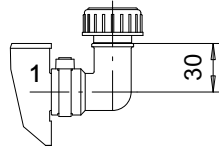


Filler at front (1)
L=115 fitting (1)
Drain outlet (3)

Filler fittings for vertical mounting positions

L= 30 fitting

code 200970000390



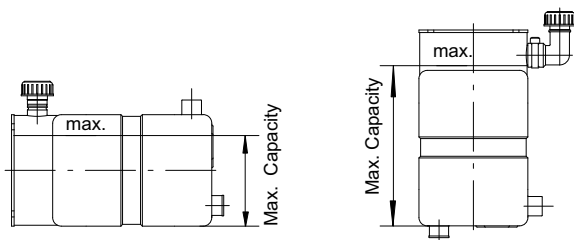
Example

	Tank					Fitting			Pos.		
3	P	0	2	5	Q	-	A	L	3	0	

L= 115 fitting code 200970000380

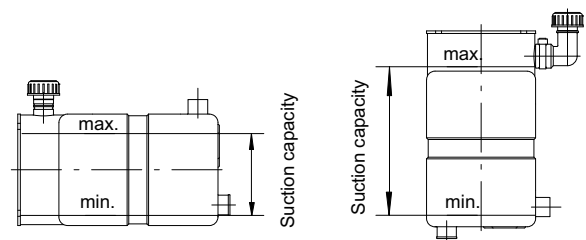
Filling capacity

AP100/1.7 pump, standard suction assembly kit



Suction capacity

AP100/1.7 pump, standard suction assembly kit



Nominal capacity	Horizontal	Vertical	Type
1.5 l	1.15 l	1.2 l	P-015Q
1.6 l	1.4 l	1.45 l	P-016Q
2.5 l	2.5 l	2.6 l	P-025Q
3.5 l	3.5 l	3.6 l	P-035Q

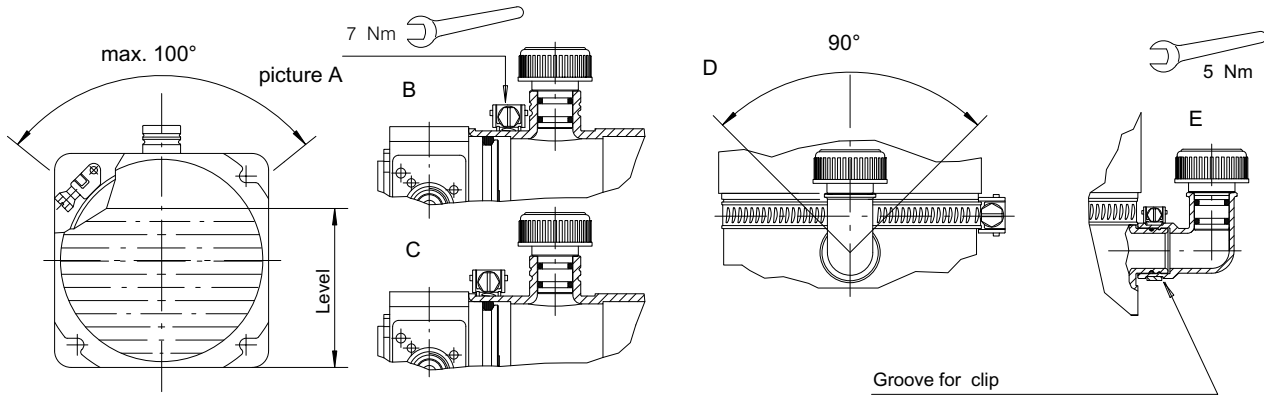
Nominal capacity	Horizontal	Vertical	Type
1.5 l	0.82 l	0.9 l	P-015Q
1.6 l	1.15 l	1.15 l	P-016Q
2.5 l	2.3 l	2.35 l	P-025Q
3.5 l	3.2 l	3.25 l	P-035Q

Notes of fitment:

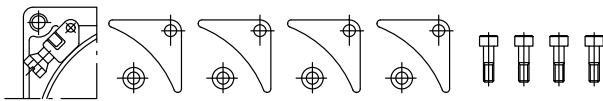
Care needs to be taken over the following aspects of fitting and securing the tank. For horizontal mounting arrangements, the clip fastener must be positioned within the limits indicated in picture A. Other positions can result in deformation of the tank, and consequently in the risk of leakage.

The clip should not be positioned against the filler as shown in pack housing, compressing the spigot O-Ring (fig.C).

Fig. D shows the range of angular adjustment allowed to the filler. Once positioned, the filler is tightened with a relative clip as shown in picture E, which also indicates the groove provides the sealing action when the filler is in use.



Fixing kit for plastic tanks of 3.5 litres FIX01
code: 200771900160



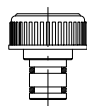
Tank fixing clip
Tank fixing bracket (q.ty 4)
Bracket spacer (q.ty 4)
M6X18 fixing bolt (q.ty 4)

Oil drain plug PLDP1-00
code: 200778000120



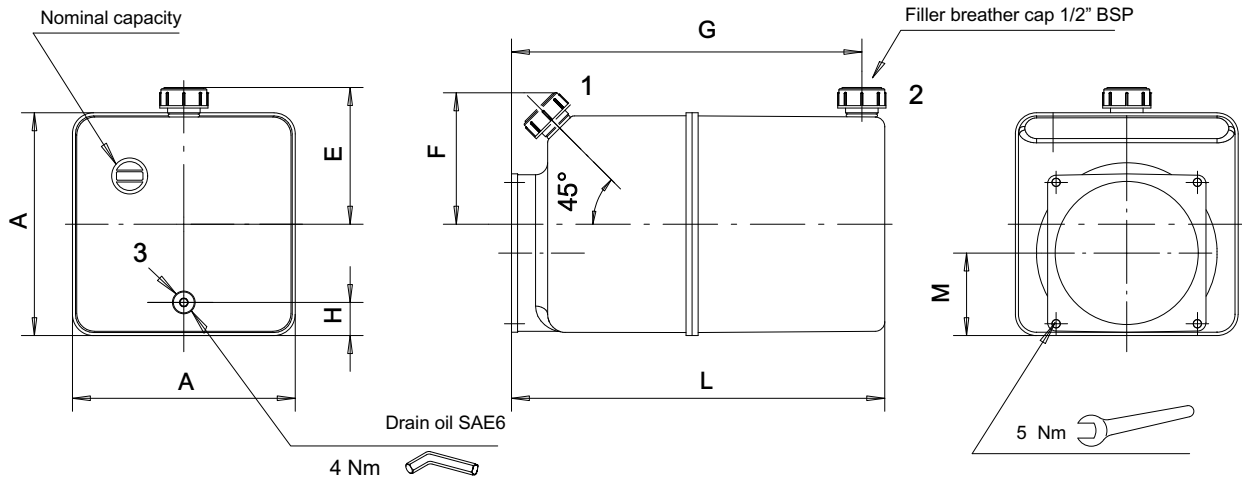
Plug Ø18
O-Ring 3050

Filler cap PLFP1-01
code: 200527099901



Ø18 filler cap with double breather
and O-Ring (q.ty 2)

3.1.3 Square tanks from 6 up to 12 litres



Example

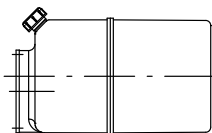
	Tank	Fitting	Pos.
3	P 0 8 0 Q - A B T		

Tanks color standard is neutral translucent

Nom .Cap .	Type	Code	A		L		E		F		G		H		M	
			mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
6 l	P-060Q-A BT	200973490140	180	7.1	310	12.2			110	4.4	291	11.5	25	1.0	66	2.6
8 l	P-080Q-A BT	200973450050	180	7.1	365	14.4			110	4.4	346	13.7	25	1.0	66	2.6
10 l	P-100Q-A BT	200973460050	180	7.1	420	16.6			110	4.4	401	15.8	25	1.0	66	2.6
12 l	P-120Q-A BT	200973490150	180	7.1	490	19.3			110	4.4	471	18.6	25	1.0	66	2.6
6 l	P-060Q-B BT	200973490120	180	7.1	310	12.2	110	4.4			291	11.5	25	1.0	66	2.6
8 l	P-080Q-B BT	200973450040	180	7.1	365	14.4	110	4.4			346	13.7	25	1.0	66	2.6
10 l	P-100Q-B BT	200973460040	180	7.1	420	16.6	110	4.4			401	15.8	25	1.0	66	2.6
12 l	P-120Q-B BT	200973490130	180	7.1	490	19.3	110	4.4			471	18.6	25	1.0	66	2.6
6 l	P-060Q-E BT	200973490100	180	7.1	310	12.2			110	4.4	291	11.5	25	1.0	66	2.6
8 l	P-080Q-E BT	200973450030	180	7.1	365	14.4			110	4.4	346	13.7	25	1.0	66	2.6
10 l	P-100Q-E BT	200973460030	180	7.1	420	16.6			110	4.4	401	15.8	25	1.0	66	2.6
12 l	P-120Q-E BT	200973490110	180	7.1	490	19.3			110	4.4	471	18.6	25	1.0	66	2.6
6 l	P-060Q-F BT	200973490060	180	7.1	310	12.2	110	4.4			291	11.5	25	1.0	66	2.6
8 l	P-080Q-F BT	200973450010	180	7.1	365	14.4	110	4.4			346	13.7	25	1.0	66	2.6
10 l	P-100Q-F BT	200973460010	180	7.1	420	16.6	110	4.4			401	15.8	25	1.0	66	2.6
12 l	P-120Q-F BT	200973490070	180	7.1	490	19.3	110	4.4			471	18.6	25	1.0	66	2.6

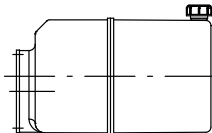
Horizontal/vertical mounting

P-0**Q-A BT*



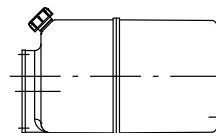
Filler at front (1)

P-0**Q-B BT



Filler at rear (2)

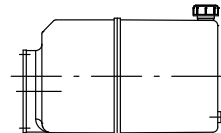
P-0**Q-E BT*



Filler at front (1)

Drain outlet (3)

P-0**Q-F BT



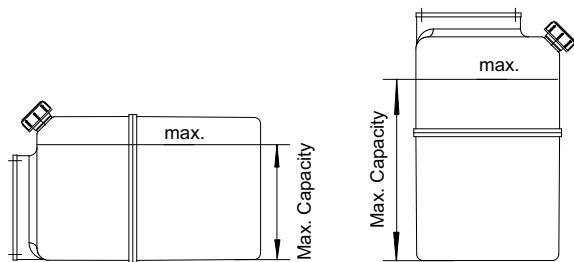
Filler at rear (2)

Drain outlet (3)

* (horizontal and vertical mounting)

Filling capacity

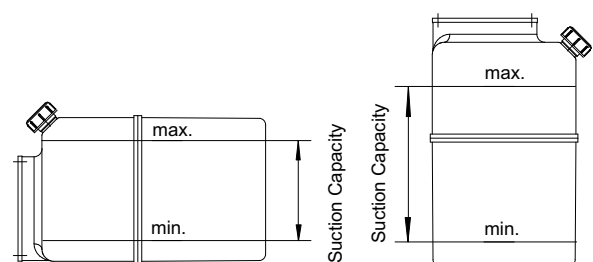
AP100/5 pump, standard suction assembly kit



Nominal capacity	Horizontal	Vertical	Type
6 l	6.5 l	6.5 l	P-060Q-**
8 l	8.5 l	8.5 l	P-080Q-**
10 l	10.5 l	10.5 l	P-100Q-**
12 l	12.5 l	12.5 l	P-120Q-**

Suction capacity

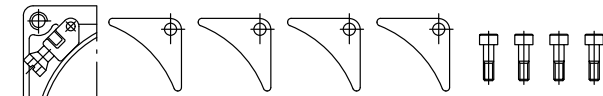
AP100/5 pump, standard suction assembly kit



Nominal capacity	Horizontal	Vertical	Type
6 l	5.5 l	5.5 l	P-060Q-**
8 l	7.5 l	7.5 l	P-080Q-**
10 l	9.5 l	9.5 l	P-100Q-**
12 l	11.5 l	11.5 l	P-120Q-**

Fixing kit for horizontal tanks FIX02

code: 200771900310



Tank fixing clip
 Tank fixing bracket (q.ty 4)
 M6X18 fixing bolt (q.ty 4)

Oil drain plug TP

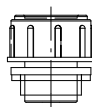
code: 200527481501



TCEI 9/16UNF SAE6 plug

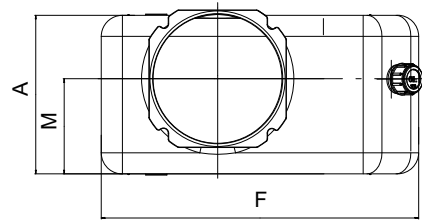
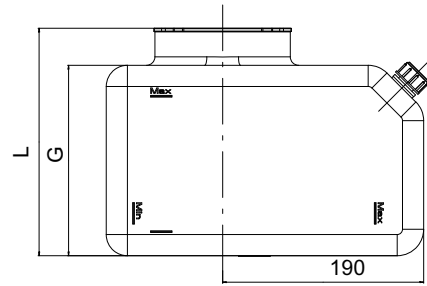
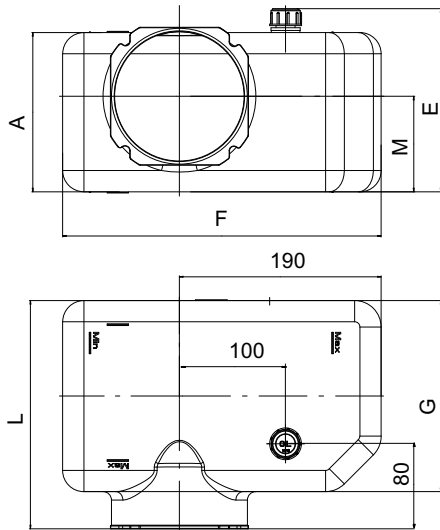
Filler cap PLFT4-01

code: 200527060502



1/2" BSP Plug

3.1.4 Rectangular tanks of 5 litres

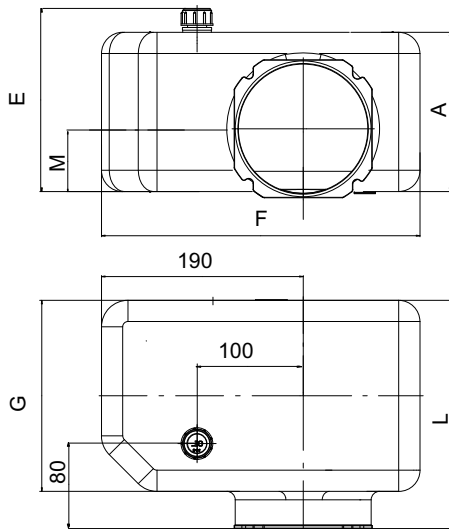


Example

	Tank	Fitting	Pos.
3	P 0 5 0 S - L B T		

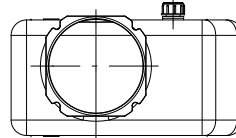
Example

	Tank	Fitting	Pos.
3	P 0 5 0 S - A B T		

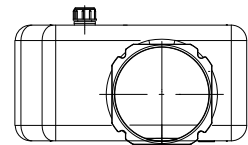


Horizontal/Vertical mounting

P-050S-L BT

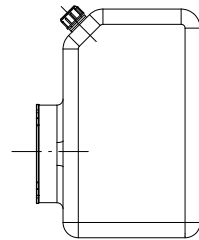
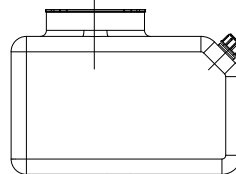


P-050S-I BT



P-050S-A BT

P-050S-A BT



Example

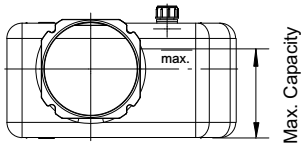
	Tank	Fitting	Pos.
3	P 0 5 0 S - I B T		

Nom .Cap	Type	Code	A		L		E		F		G		M	
			mm	inch.	mm	inch.	mm	inch.	mm	inch.	mm	inch.	mm	inch.
5l	P-050S-L BT	200973440010	150	6.03	215	8.64	172.5	6.93	300	12.06	180	7.23	90	3.62
5l	P-050S-A BT	200973440020	150	6.03	215	8.64			300	12.06	180	7.23	90	3.62
5l	P-050S-I BT	200773440030	150	6.03	215	8.64	172.5	6.93	300	12.06	180	7.23	60	2.41

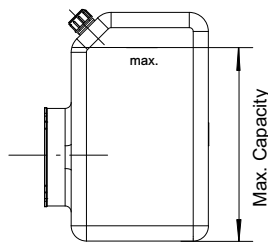
Filling capacity

AP100/5 pump, standard suction assembly kit

P-050S-LBT / P-050S-IBT

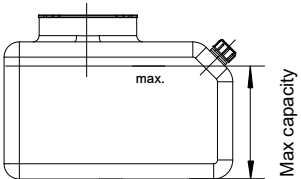


Max. Capacity



Max. Capacity

P-050S-ABT



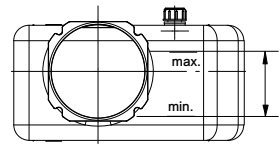
Max capacity

P-050S-ABT

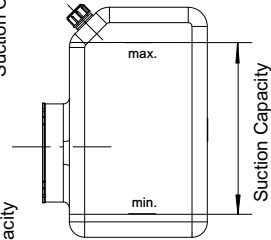
Nominal capacity	Horizontal	Vertical	Type
5 l	6.2 l	6.0 l	P-050S-ABT
5 l	6.1 l	—	P-050S-LBT
5 l	6.1 l	—	P-050S-IBT

Suction capacity

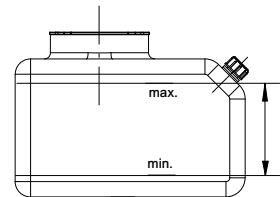
AP100/5 pump, standard suction assembly kit



Suction Capacity



Suction Capacity

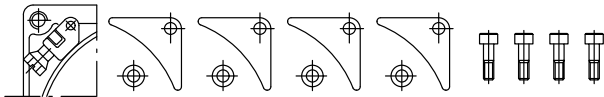


Suction Capacity

Nominal capacity	Horizontal	Vertical	Type
5 l	5.5 l	5.0 l	P-050S-ABT
5 l	5.3 l	—	P-050S-LBT
5 l	5.3 l	—	P-050S-IBT

Fixing kit FIX01

code: 200771900160



Tank fixing clip

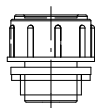
Tank fixing bracket (q.ty 4)

Bracket spacer (q.ty 4)

M6X18 fixing bolt (q.ty 4)

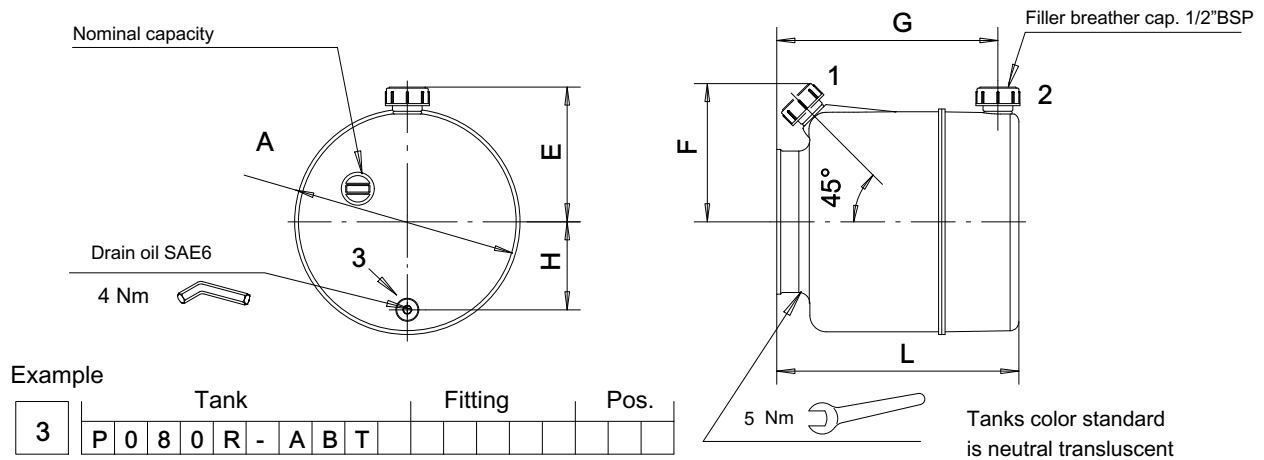
Filler cap PLFT4-01

code: 200527060502



1/2" BSP Plug

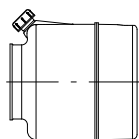
3.1.5 Round tanks from 6 to 14 litres



Nom. Cap.	Type	Code	A		L		E		F		G		H	
			mm	inch.	mm	inch.	mm	inch.	mm	inch.	mm	inch.	mm	inch.
6 l	P-060R-A BT	20973490230	200	7.1	220	8.7			127	5	201	8.0	80	3.2
8 l	P-080R-A BT	20973450070	200	7.1	285	11.3			127	5	266	10.5	80	3.2
10 l	P-100R-A BT	20973460070	200	7.1	325	12.8			127	5	306	12.1	80	3.2
12 l	P-120R-A BT	20973490240	200	7.1	410	16.2			127	5	391	15.4	80	3.2
14 l	P-140R-A BT	20973490200	200	7.1	490	19.3			127	5	471	18.6	80	3.2
6 l	P-060R-B BT	20973490210	200	7.1	220	8.7	123	4.9			201	8.0	80	3.2
8 l	P-080R-B BT	20973450060	200	7.1	285	11.3	123	4.9			266	10.5	80	3.2
10 l	P-100R-B BT	20973460060	200	7.1	325	12.8	123	4.9			306	12.1	80	3.2
12 l	P-120R-B BT	20973490220	200	7.1	410	16.2	123	4.9			391	15.4	80	3.2
14 l	P-140R-B BT	20973490190	200	7.1	490	19.3	123	4.9			471	18.6	80	3.2
6 l	P-060R-E BT	20973490290	200	7.1	220	8.7			127	5	201	8.0	80	3.2
8 l	P-080R-E BT	20973450100	200	7.1	285	11.3			127	5	266	10.5	80	3.2
10 l	P-100R-E BT	20973460100	200	7.1	325	12.8			127	5	306	12.1	80	3.2
12 l	P-120R-E BT	20973490300	200	7.1	410	16.2			127	5	391	15.4	80	3.2
14 l	P-140R-E BT	20973490180	200	7.1	490	19.3			127	5	471	18.6	80	3.2
6 l	P-060R-F BT	20973490250	200	7.1	220	8.7	123	4.9			201	8.0	80	3.2
8 l	P-080R-F BT	20973450080	200	7.1	285	11.3	123	4.9			266	10.5	80	3.2
10 l	P-100R-F BT	20973460080	200	7.1	325	12.8	123	4.9			306	12.1	80	3.2
12 l	P-120R-F BT	20973490260	200	7.1	410	16.2	123	4.9			391	15.4	80	3.2
14 l	P-140R-F BT	20973490160	200	7.1	490	19.3	123	4.9			471	18.6	80	3.2

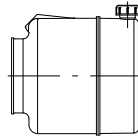
Horizontal/vertical mounting

P-0**R-A BT*



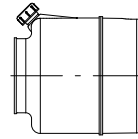
Filler at front (1)

P-0**R-B BT



Filler at rear (2)

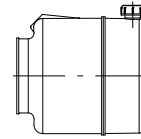
P-0**R-E BT*



Filler at front (1)

Drain outlet (3)

P-0**R-F BT



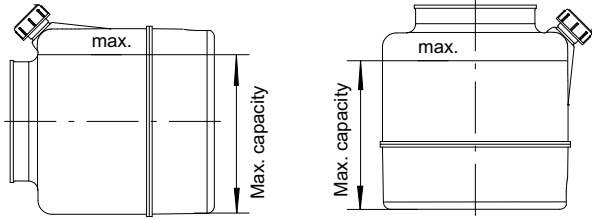
Filler at rear (2)

Drain outlet (3)

* (horizontal and vertical mounting)

Filling capacity

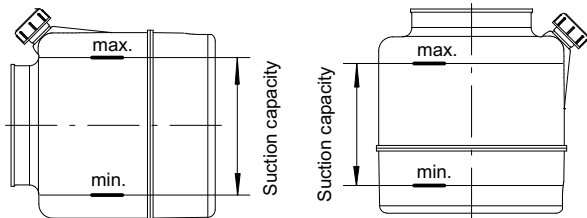
AP100/5 pump, standard suction assembly kit



Nominal capacity	Horizontal	Vertical	Type
6 l	4.8 l	4.5 l	P-060R-**
8 l	6.8 l	6.5 l	P-080R-**
10 l	7.5 l	8.0 l	P-100R-**
12 l	8.5 l	8.5 l	P-120R-**
14 l	12 l	12.5 l	P-140R-**

Suction capacity

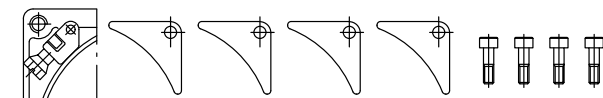
AP100/5 pump, standard suction assembly kit



Nominal capacity	Horizontal	Vertical	Type
6 l	4.5 l	3.5 l	P-060R-**
8 l	6.5 l	5.0 l	P-080R-**
10 l	7.0 l	7.0 l	P-100R-**
12 l	8.0 l	7.5 l	P-120R-**
14 l	11.5 l	11.5 l	P-140R-**

Fixing kit for horizontal tanks FIX02

code : 200771900310



Tank fixing clip

Tank fixing bracket (q.ty 4)

M6X18 fixing bolt (q.ty 4)

Oil drain plug TP

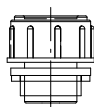
code: 200527481501



TCEI 9/16UNF SAE6 plug

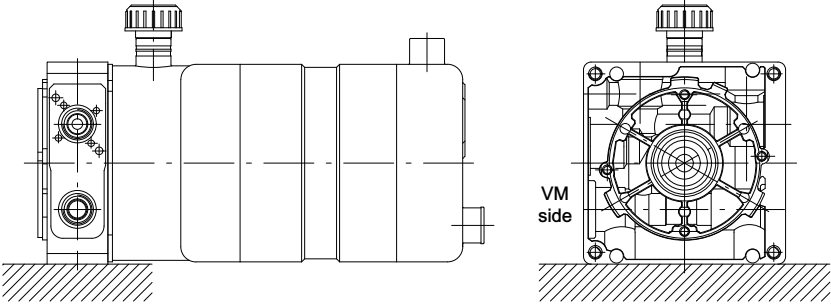
Filler cap PLFT4-01

code: 200527060502

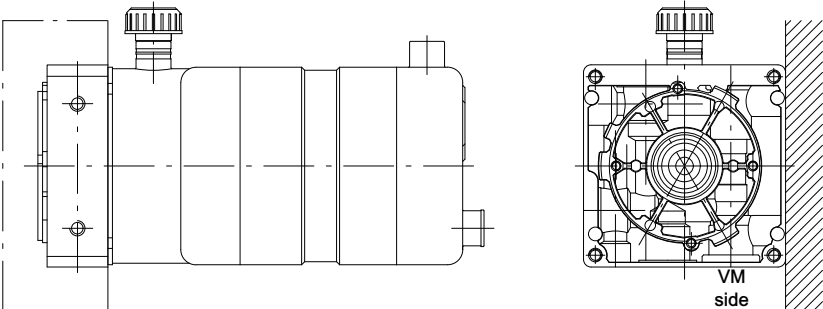


1/2" BSP plug

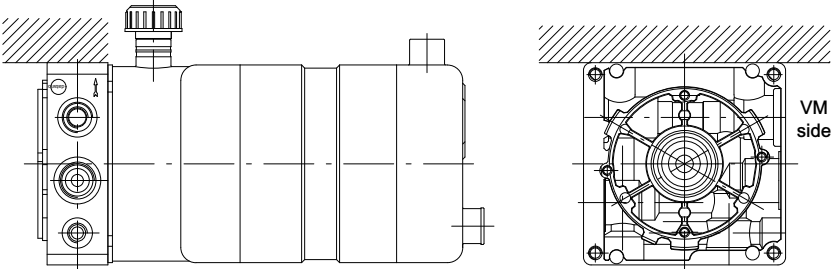
3.1.6 Plastic tanks horizontal assembling positions



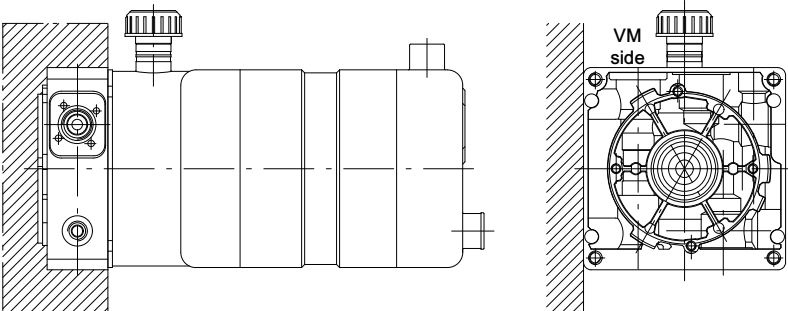
Assembling position
P01



Assembling position
P03



Assembling position
P02



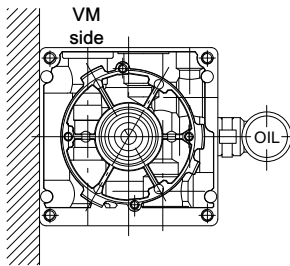
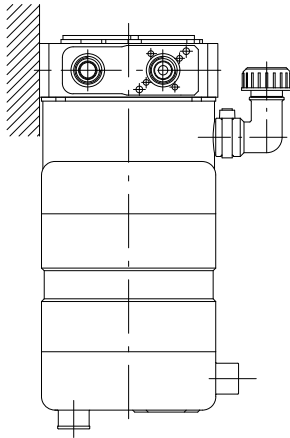
Assembling position
P04

Example

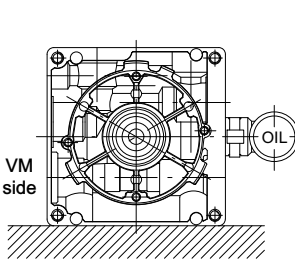
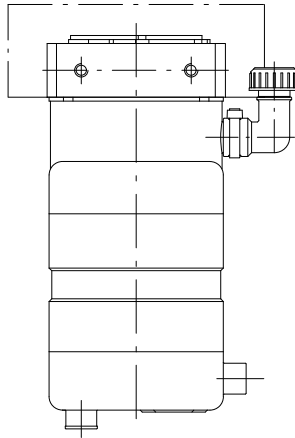
	Tank					Fitting				Pos.		
3	P	0	2	5	Q - A					P	0	1

3.1.7 Plastic tanks vertical assembling positions

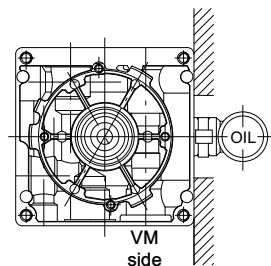
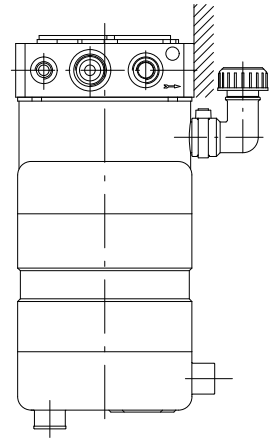
Assembling position P15



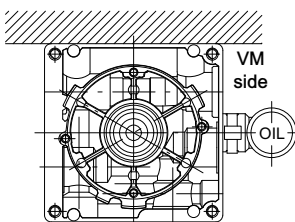
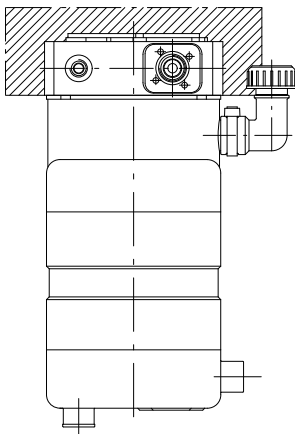
Assembling position P35



Assembling position P25



Assembling position P45



Example

	Tank						Fitting			Pos.			
3	P	0	3	5	Q	-	A	L	3	0	P	1	5

The power pack housing shown in the examples is UP100/K1

3.2 Metal tanks

3.2.1 Technical information

Materials: Sheet metal.

Color: Black paint finish (Standard)

Condition of use: Suitable fluids: mineral oil based hydraulic fluids responding to ISO -DIN standards.

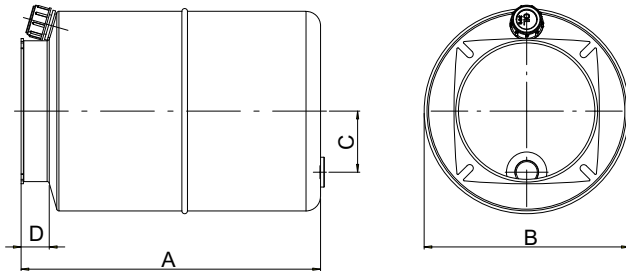
Operating temperature range: -15 / +80°C

Hydrocarbon based fluids (e.g. benzene, benzol, etc.) must not be used.

Versions: tanks are available in numerous versions, allowing installation of the power pack in different horizontal and vertical positions.

For additional tank shapes and versions, please contact our Sales Center

3.2.2 Tanks L050R-01, L080R-01

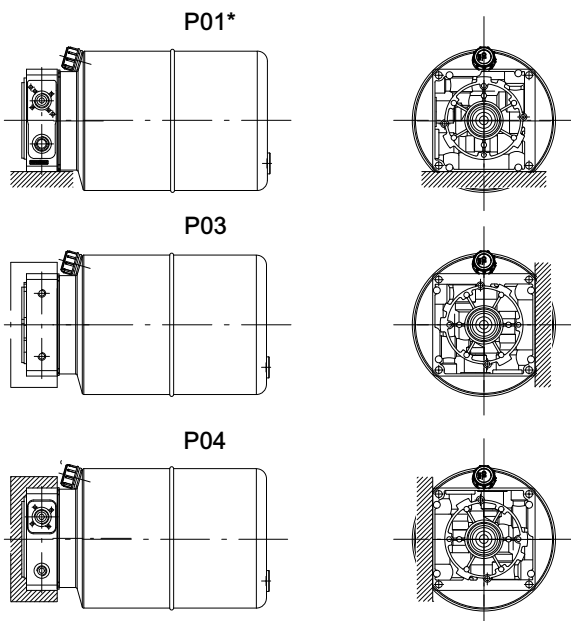


Example

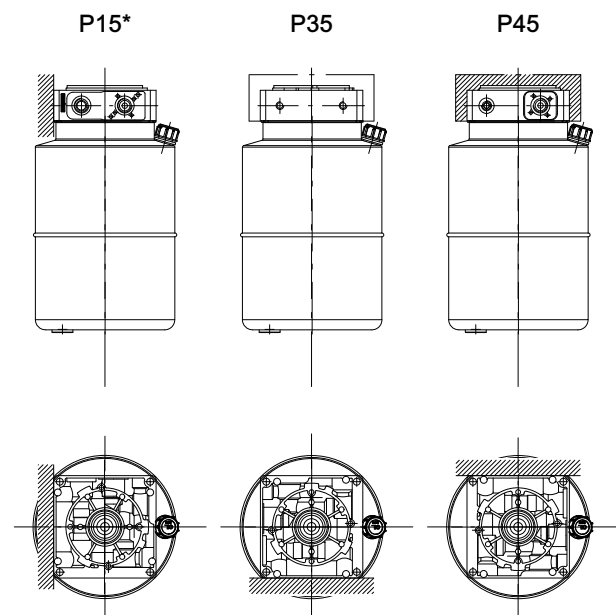
	Tank				Fitting				Pos.				
3	L	0	8	0	R	-	0	1			P	1	5

Nom. Cap.	Type	Code	A		B		C		D		Oil filler cap	Oil drain plug
			mm	inch.	mm	inch.	mm	inch.	mm	inch.		
5 l	L050R-01	200972440321	270	10.7	180	7.09	55	2.17	25	1.0	3/8" BSP	1/2" BSP
8 l	L080R-01	200972450060	285	11.3	200	7.9	60	2.4	25	1.0	3/8" BSP	1/2" BSP

Horizontal assembling positions

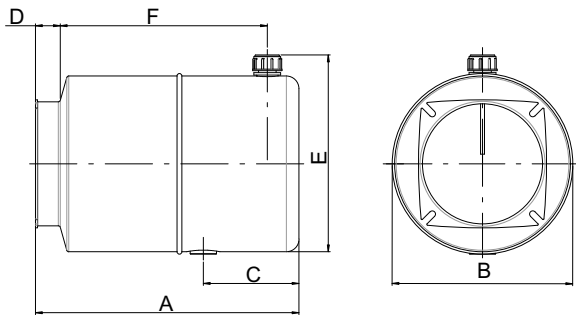


Vertical assembling positions



* L050R-01 position not suitable for UP100 K3P0* and K4P0*

3.2.3 Tanks L050R-02, L080R-02

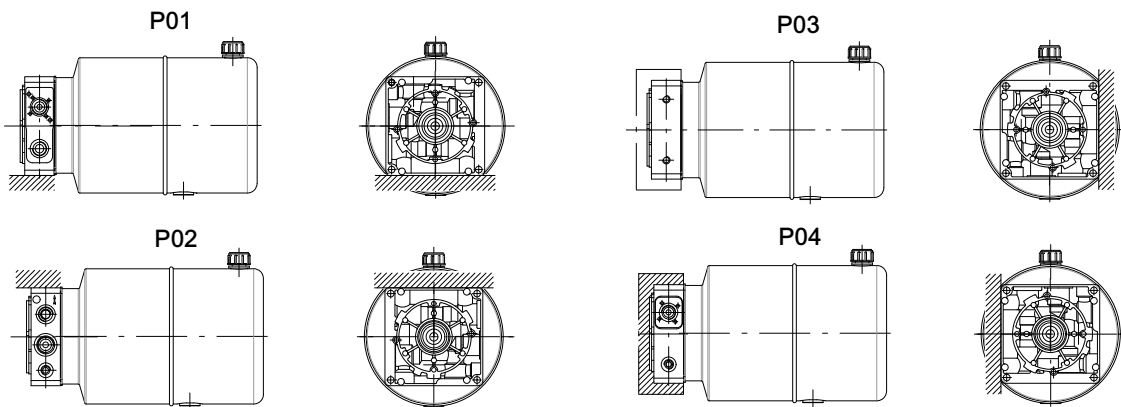


Example

	Tank						Fitting			Pos.				
3	L	0	8	0	R	-	0	2				P	0	1

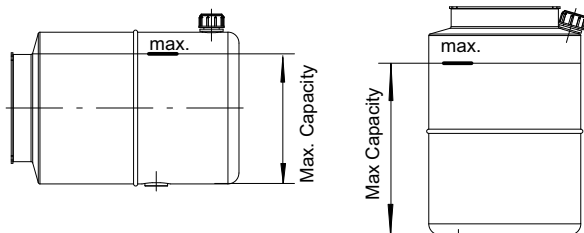
Nom. Cap.	Type	Code	A		B		C		D		E		F		Oil filler cup	Oil drain plug
			mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch		
5 l	L050R-02	200972440010	270	10.7	180	7.09	98	3.85	25	1.0	201.5	7.93	212.5	8.4	3/8"BSP	1/2"BSP
8 l	L080R-02	200972450010	285	11.3	200	7.9	105	2.4	25	1.0	221.5	8.72	225	8.9	3/8"BSP	1/2"BSP

Horizontal assembling positions

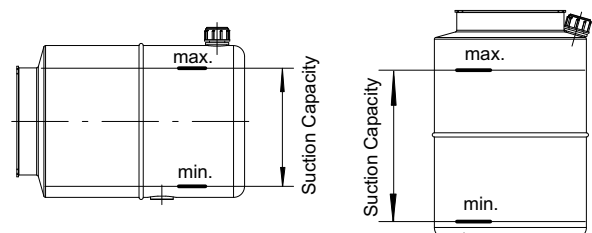


Filling capacity

AP100/5 pump, standard suction assembly kit



AP100/5 pump, standard suction assembly kit



Suction capacity

Nominal capacity	Horizontal	Vertical	Type
5 l	5.4 l	5.2 l	L050R-01
5 l	5.4 l	/	L050R-02
8 l	7.5 l	7.0 l	L080R-01
8 l	7.5 l	/	L080R-02

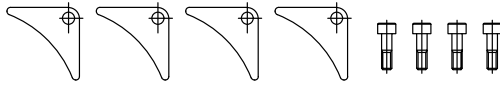
Suction capacity

Nominal capacity	Horizontal	Vertical	Type
5 l	4.9 l	4.9 l	L050R-01
5 l	4.9 l	/	L050R-02
8 l	7.0 l	6.0 l	L080R-01
8 l	7.0 l	/	L080R-02

3.2.4 Metal tanks fitting notes

Fixing kit for metal tanks of 3,5 liters and over FIX03

code: 200771900280



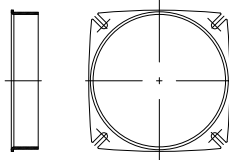
Fixing bracket (q.ty 4)

Bracket spacer (q.ty 4)

M6X18 fixing bolt (q.ty 4)

Tank collar LS01

code: 200609400052



Spigot diameter 123

Height of collar 25 mm.

Material: pressed steel

Provides interface between power pack housing and special tank

Oil filler cap

Plastic material

Complete with breather

Thread: Code:

3/8" BSP PLFT3-01 200678000350

1/2" BSP PLFT4-01 200527060502

1" BSP PLFT6-01 200527060901

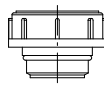
3/8" BSP



1/2" BSP



1" BSP



Oil filler cap

Plastic material

Complete with breather

Complete with dipstick

Thread:

Code:

3/8" BSP (L=25) PLFT3-A01 200678000700

3/8" BSP (L=81) PLFT3-A02 200678000370

3/8" BSP (L=103) PLFT3-A03 200678000380

3/8" BSP (L=165) PLFT3-A04 200678000340

3/8" BSP (L=81) PLFT3-A05 200527099907*

1/2" BSP (L=140) PLFT4-A01 200678000050

1" BSP (L=165) PLFT6-A01 200678000500

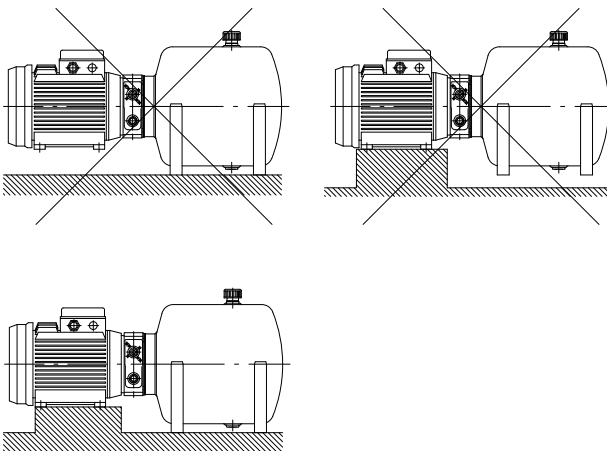
* for L050R-01



Horizontal assembling for power pack with plastic/metal tank

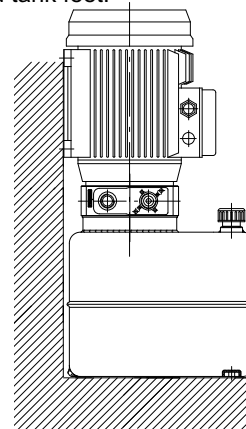


Important: Overhanging assembling configurations for motor or tank are not admitted



Important: For hydraulic units assembling A.C. electric motors equal or higher than 1.5 HP- 1.1KW, it's recommended to order the B34 frame size version.

Consequently it is recommended to fix the hydraulic unit by the A.C. electric motor feet or where possible both electric motor and tank feet.



Vertical assembling for power pack with plastic/metal tanks

4 Suction/Return assembly kits

This section is intended to assist those customers who choose to purchase single sub-assemblies separately and put together their own power packs.

Table below shows the ordering code for suction and discharging kit.

The right choice is a function of tank capacity, assembly position and pump.

This information is not requested when building a complete power pack ordering code

4.1 Suction assembly kits for plastic tanks

4.1.1 Suction assembly kits for square tanks from 1,5 to 3,5 litres

Pump S309	Horizontal positions - P01, P02, P03, P04			
	P-015Q-*	P-016Q-*	P-025Q-*	P-035Q-*
AP100/1.2	200685001370 - GA01	200759902120 - GA28	200759902120 - GA28	200759902120 - GA28
AP100/1.7				
AP100/2.5				
AP100/3.5				
AP100/4.3				
AP100/5				
AP100/6.5				
AP100/8				
AP100/10				

Pump S309	Vertical positions - P15, P35, P25, P45			
	P-015Q-*	P-016Q-*	P-025Q-*	P-035Q-*
AP100/1.2	200759901940 - GA17	200759901760 - GA02	200759901990 - GA21	200759902020 - GA24
AP100/1.7				
AP100/2.5				
AP100/3.5				
AP100/4.3		200759901940 - GA17	200759901980 - GA20	
AP100/5				200759901780 - GA20
AP100/6.5			200759901880 - GA12	
AP100/8				
AP100/10			200759901770 - GA03	200759901860 - GA10

4.1.2 Suction assembly kits for square tanks from 6 to 12 litres

Pump S309	Horizontal positions - P01, P02, P03, P04			
	P-060Q-**	P-080Q-**	P-100Q-**	P-120Q-**
AP100/1.2	200759901830 - GA09	200759901830 - GA09	200759901830 - GA09	200759901830 - GA09
AP100/1.7				
AP100/2.5				
AP100/3.5				
AP100/4.3				
AP100/5				
AP100/6.5				
AP100/8				
AP100/10				

Pump S309	Vertical positions - P15, P25, P35, P45			
	P-060Q-**	P-080Q-**	P-100Q-**	P-120Q-**
AP100/1.2	200759901790 - GA05	200759902160 - GA30	200759902050 - GA27	200759901900 - GA14
AP100/1.7				
AP100/2.5	200759902020 - GA24	200759901800 - GA06	200759901810 - GA07	200759901870 - GA11
AP100/3.5				
AP100/4.3				
AP100/5	200759901780 - GA04	200759902030 - GA25	200759902040 - GA26	200759901890 - GA13
AP100/6.5				
AP100/8				
AP100/10				

4.1.3 Suction assembly kits for round tanks from 6 to 14 litres

Pump S309	Horizontal positions - P01, P02, P03, P04				
	P-060R-**	P-080R-**	P-100R-**	P-120R-**	P-140R-**
AP100/1.2	200759901820 - GA08	200759901820 - GA08	200759901820 - GA08	200759901820 - GA08	200759901820 - GA08
AP100/1.7					
AP100/2.5					
AP100/3.5					
AP100/4.3					
AP100/5					
AP100/6.5					
AP100/8					
AP100/10					

Pump S309	Vertical positions - P15, P25, P35, P45				
	P-060R-**	P-080R-**	P-100R-**	P-120R-**	P-140R-**
AP100/1.2	200759901970 - GA19	200759901780 - GA04	200759901790 - GA05	200759902050 - GA27	200759901900 - GA14
AP100/1.7				200759901860 - GA10	
AP100/2.5		200759901770 - GA03			
AP100/3.5	200759901920 - GA16		200759902010 - GA23	200759901870 - GA11	
AP100/4.3		200759901960 - GA18			200759901990 - GA21
AP100/5	200759901920 - GA16		200759902010 - GA23	200759901780 - GA04	
AP100/6.5		200759901960 - GA18			200759901990 - GA21
AP100/8	200759901960 - GA18		200759901990 - GA21	200759901780 - GA04	
AP100/10		200759901960 - GA18			200759901990 - GA21

4.2 Suction assembly kits for metal tanks

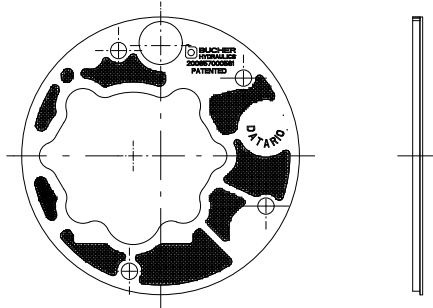
4.2.1 Suction assembly kits for square and round metal tanks from 5 to 18 litres

Pump S309	Horizontal positions - P01, P02, P03, P04			
	L-050R-01	L-080R-01	L-050R-02	L-080R-02
AP100/1.2	200759901910 - GA15	200759901820 - GA08	200759901910 - GA15	200759901820 - GA08
AP100/1.7				
AP100/2.5				
AP100/3.5				
AP100/4.3				
AP100/5				
AP100/6.5				
AP100/8				
AP100/10				

Pump S309	Vertical positions - P15, P25, P35, P45	
	L-050R-01	L-080R-01
AP100/1.2	200759901780 - GA04	200759901780 - GA04
AP100/1.7	200759901860 - GA10	
AP100/2.5		
AP100/3.5		
AP100/4.3	200759902010 - GA23	
AP100/5	200759902000 - GA22	200759901860 - GA10
AP100/6.5		
AP100/8	200759901990 - GA21	200759902010 - GA23
AP100/10		

4.3 Accessories

4.3.1 Filter conveyor: standard FC01



Filter conveyor

PATENTED

Assembled on the return line

Plastic material

Polyester filter area

150 micron filtering net

Fixed directly on the housing

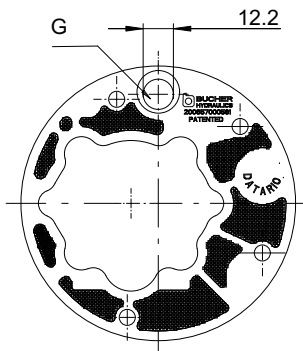
Seal for the pump body.

Code with screws: 200957000230

The internal shape of the filtering conveyor replaces the external profile of the gear pump as well as the external profile matches the internal diameter of the tank spigot. The main feature of the filtering conveyor is to collect all returns avoiding oil-foam effects, possible small clearances between the internal and external above profiles have to be judged as normal referring 150 micron size to the filtering net capacity, only.

4.3.2 Filter conveyor : special applications

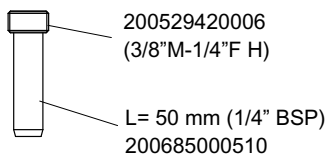
For cavity "G" suction mounting



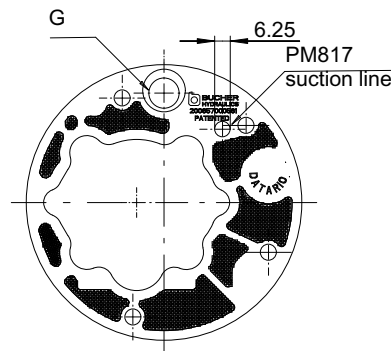
Filter conveyor FC02

code with screws: 200957000240

Suction tube code:
200785000200



For UP100K1G2-19 mounting



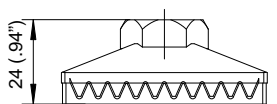
Filter conveyor FC03

code with screws: 200957000250

Return tube for G cavity used for
UP100K1G2-19 mounting
Code: 200785000200

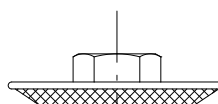


4.3.3 Suction filter

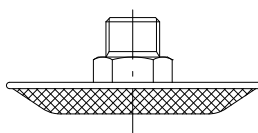


Suitable for standard version

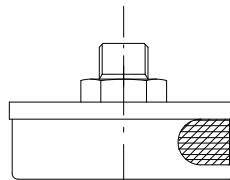
Suction plastic filter FA01
Square: 59 mm
Filtering: 216 micron
Thread: 3/8" BSP - Female
Code: 200546112025



Suction steel filter FA02
Diameter: 60 mm.
Filtering: 250 micron
Thread: 3/8" BSP - Female
Code: 200546112008



Suction steel filter FA03
Diameter: 80 mm.
Filtering: 250 micron
Thread: 3/8" NPT - Male
Code: 200546112009



Suction steel filter
Diameter: 80 mm.
Filtering: 60 micron
Thread: 3/8" NPT
Code: 200657000050 (Male) FA04
200657000060 (Female) FA05

5 Electric motors

Electric motor available:

5.1 D.C. motors

Generally used for mobile applications

5.1 D.C. motors

5.1.1 Technical information

Available versions:

Voltage: 12-24 and 48 V

Power rating: 0.8 ÷ 3 kW.

For different input voltage and power rating, consult our Sales Center.

Direction of rotation:

Unless otherwise stated, all motors are specified clockwise rotation, suitable for driving counterclockwise pump.

5.2 A.C. motors

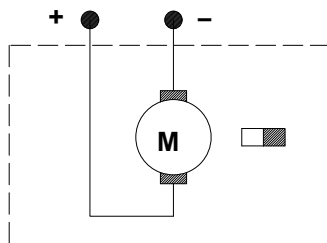
Generally used for stationary applications

Type of winding:

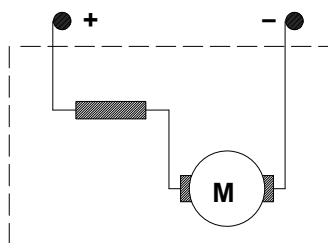
D.C. motors can be manufactured in different types of field windings:

- Permanent magnets
- Series
- Compound

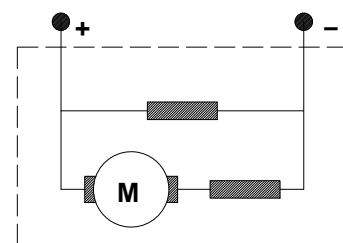
Permanent magnets



Series



Compound



Insulation class:

The class of electric insulation reflects the maximum temperature the motor can register during operation without damage to the insulating material internally of the motor itself.

The following table indicates insulation classes to CEI 15-26.

Class	Y	A	E	B	F	H
Temperature (°C)	90	105	120	130	155	180

Type of duty:

To ensure selection of the electric motor best suited to a given set of operating conditions, the duty cycle needs to be verified. Duty cycles S1, S2 and S3 are defined below in accordance with CEI 2-3

Continuous duty S1:

Operation on-load (steady conditions) for a period of indefinite duration, during which the motor reaches thermal equilibrium without exceeding the maximum permissible temperature.

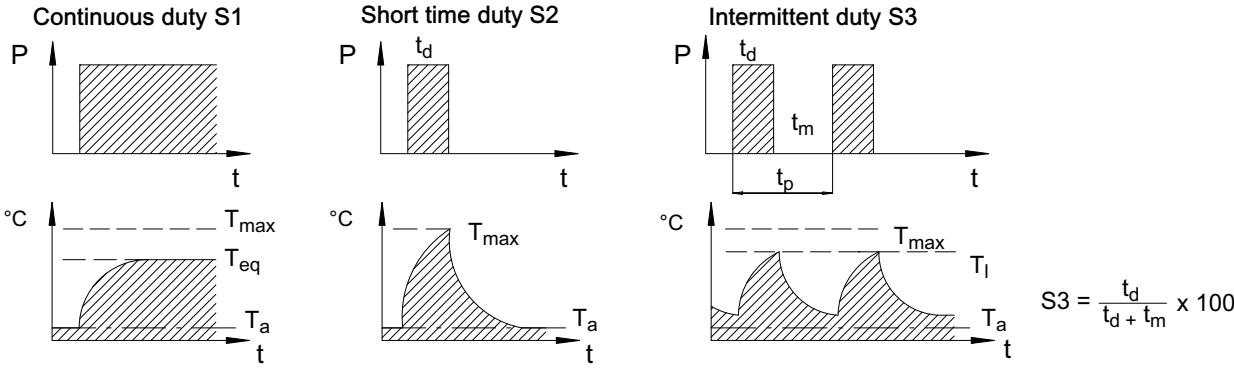
Short time duty S2

Operation on-load (steady conditions) for a period of limited duration, denoted t_d in the diagram, during which maximum permissible temperature is reached, followed by an off-load period of duration sufficient for the temperature of the motor to return to ambient temperature.

Intermittent duty S3

A sequence of identical cycles, each 10 minutes in duration, the single cycle comprises a period of operation on-load t_d , during which the motor may reach its maximum permissible temperature, is reached, followed by an off-load period of limited duration t_m , insufficient for the temperature of the motor to return to ambient temperature.

The value of S3 indicates the duration of the on-load period t_d in relation to the overall cycle time t_p , as a percentage.



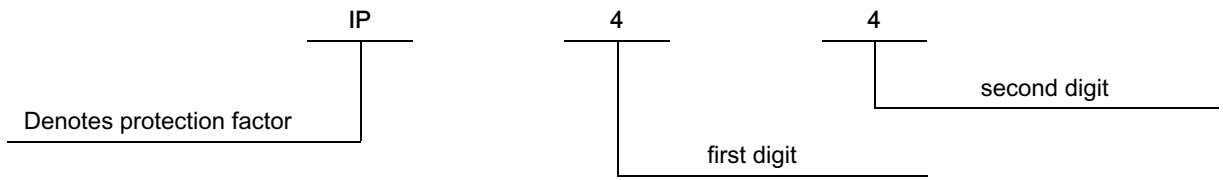
- P . . = load
- T_{eq} = temperature at thermal equilibrium
- T_{max} = maximum permissible temperature
- T_l = operating temperature
- T_a = ambient temperature
- t_d = duration of on-load period
- t_m = duration of off-load period
- t_p = duration of cycle (10 min.)

Degree of protection:

This indicates the level of protection afforded in preventing contact between live parts of the motor and people or foreign matter generally, and preventing the penetration of water.

The degree of protection is indicated in accordance to the initials IP and two identifying digits:

Example:



The first digit indicates the degree of protection afforded to the motor against contact with people or foreign bodies.

The second digit indicates the degree of protection afforded to the motor against the effects of penetration by water.

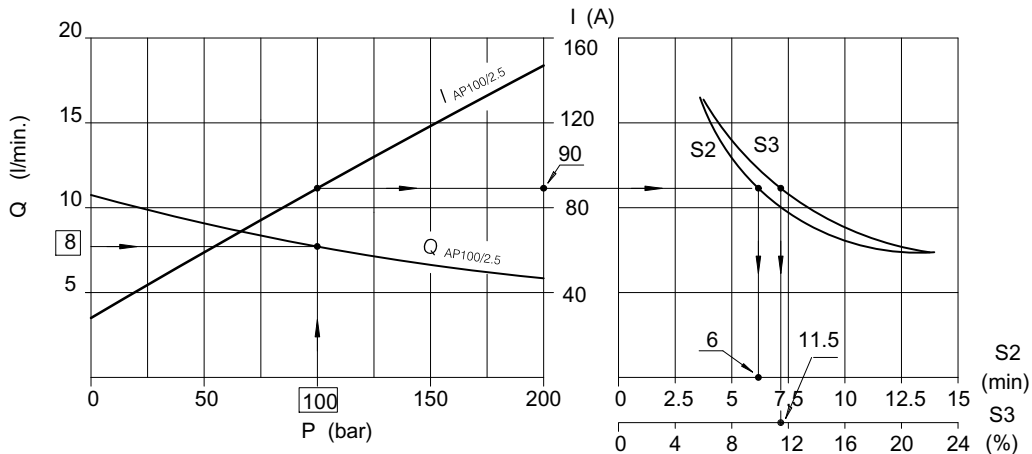
0	no protection	0	no protection
1	protection against solid bodies measuring > 50 mm	1	protection against water dripping vertically
2	protection against solid bodies measuring > 12 mm	2	protection against water dripping at 15° max
3	protection against solid bodies measuring > 2.5 mm	3	protection against rain
4	protection against solid bodies measuring > 1 mm	4	protected against water splash
5	protection against dust	5	protected against water spray

The degree of protection indicated for each individual electric motor, refers to the motor when mounted to a Bucher Hydraulics S.p.A. power pack.

5.1.2 Characteristic curves

Characteristic curves are given for each motors, from which to establish pressure, flow rate and current consumption

values, and S2 and S3 duty cycles.



5.1.3 Example of how the graphs are used

Required data

Flow rate $Q = 8 \text{ l/l'}$

Pressure $p = 100 \text{ bar}$

Pump displacement

Determined by the intersection of the required p and Q curves.

In the example indicated, pump AP100/2.5 has the required p and Q specifications.

In the event that there is no point of intersection with any curve, a displacement as near as possible to the required flow rate should be selected.

Current consumption

This is determined by taking a vertical line from the pressure value to its point of intersection with the I curve corresponding to the selected displacement.

In the example illustrated, current consumption is:

$I = 90 \text{ Ampere}$

Type of use

Having established the current, the relationship of the S2 and S3 curves will give the following values:

S2 = 6 min. S3 = 11.5%

Terminals

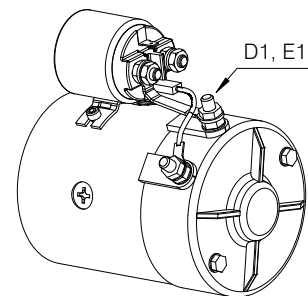
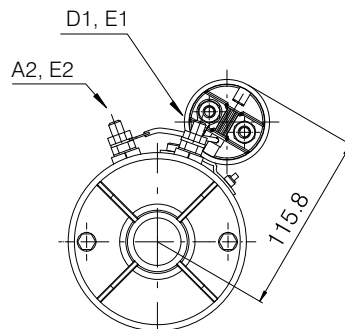
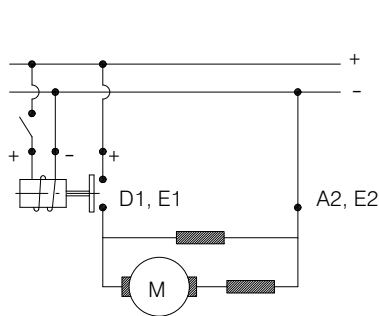
Unless otherwise stated, d.c. motors supplied by Bucher Hydraulics S.p.A. have two terminals.

Poles are identified in accordance with IEC34-8

A1 - A2 Armature

D1 - D2 Series

B1 - B2 Poles



E1 - E2 Parallel

Electric diagram

A typical arrangement for connection of the motor to the power supply is shown in the diagram.

Mounting directions



The tie bolts must not be withdrawn completely while fitting motor, but retracted just for a short distance (30-50 mm max).

Once fitted to the power pack, the motor should be run off-load momentarily (5 seconds max) to verify its correct operation: supply power to the windings and measure the current drain, which must not exceed the following values:

24 V motor - $I < 35 \text{ Ampere}$

12 V motor - $I < 70 \text{ Ampere}$

Power cable

The wire selected for power connections must be of cross section appropriate for the rated current of the motor.

Tightening torques

When assembling the motor and power pack and securing the wires of the power cable to the motor terminals, observe the tightening torque values indicated.

Brush life

The brushes will wear down progressively with continued operation of the motor, and must be replaced when reduced to their minimum useful length.

Since the rate of wear on the brushes is dictated by the operating conditions and cannot therefore be broadly specified, consult our Sales Center for guidance.

Versions available on request

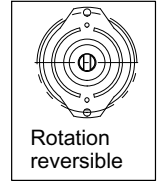
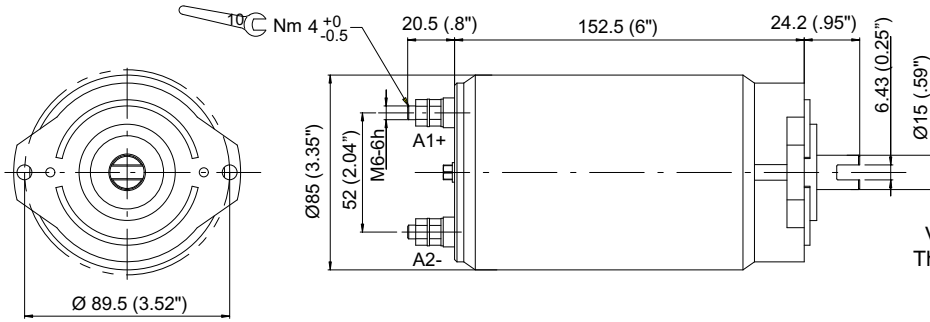
1. Motors with electrical device monitoring brush wear
2. Motors with thermocouple
3. Fan-cooled motors

Fan-cooled motors, 12 and 24 volt, are available, for further information, consult our Sales Center.

Bucher Hydraulics S.p.A. is not an electric motors manufacturer so these components come from third part. Bucher Hydraulics S.p.A. reserves the right to change the motor supplier without notice whenever considers it necessary. Minor dimensional and cosmetic differences may exist.

Voltage	Nominal Power
12 V	800 W
24 V	800 W

Protection index: IP54
 Insulation class: F
 Type of winding: Permanent magnets
 Relay fixing kit 200709000090
 Minimum brushes length: 5 mm (0.2 inches)



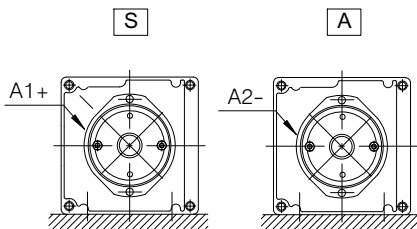
Attention!
 Verify the electrical connection.
 The motor must rotate clockwise

Weight: 3.70 Kg (8.15 lb)

Rotation reversible	Motor		Motor with relay			
	12V-800W	24V-800W	12V-800W	24V-800W		
Type	C128PK/A0	C228PK/A0	C128PK/A0 + R109	C228PK/A0 + R215		
Code	200543912809	200543922801	200763310270	200763320300		
Relay			Standard			
Relay type			R109	R215		

Motor mounting position

Standard positions



Electric motor

Pos.

5	C	2	2	8	P	K	/	A	1	S
---	---	---	---	---	---	---	---	---	---	---

Example

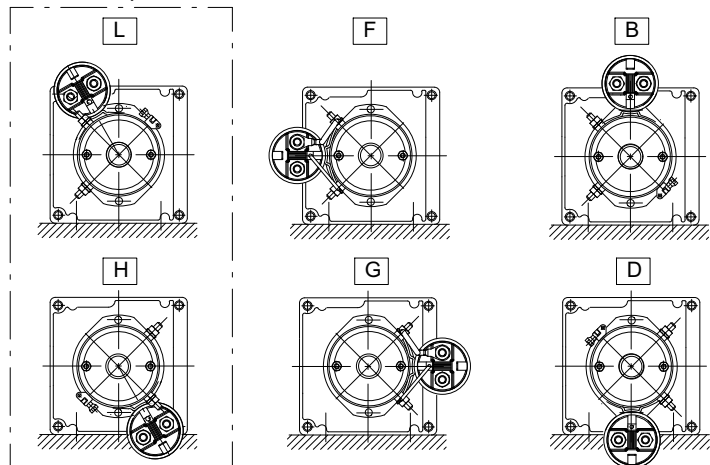
Relè

Pos.

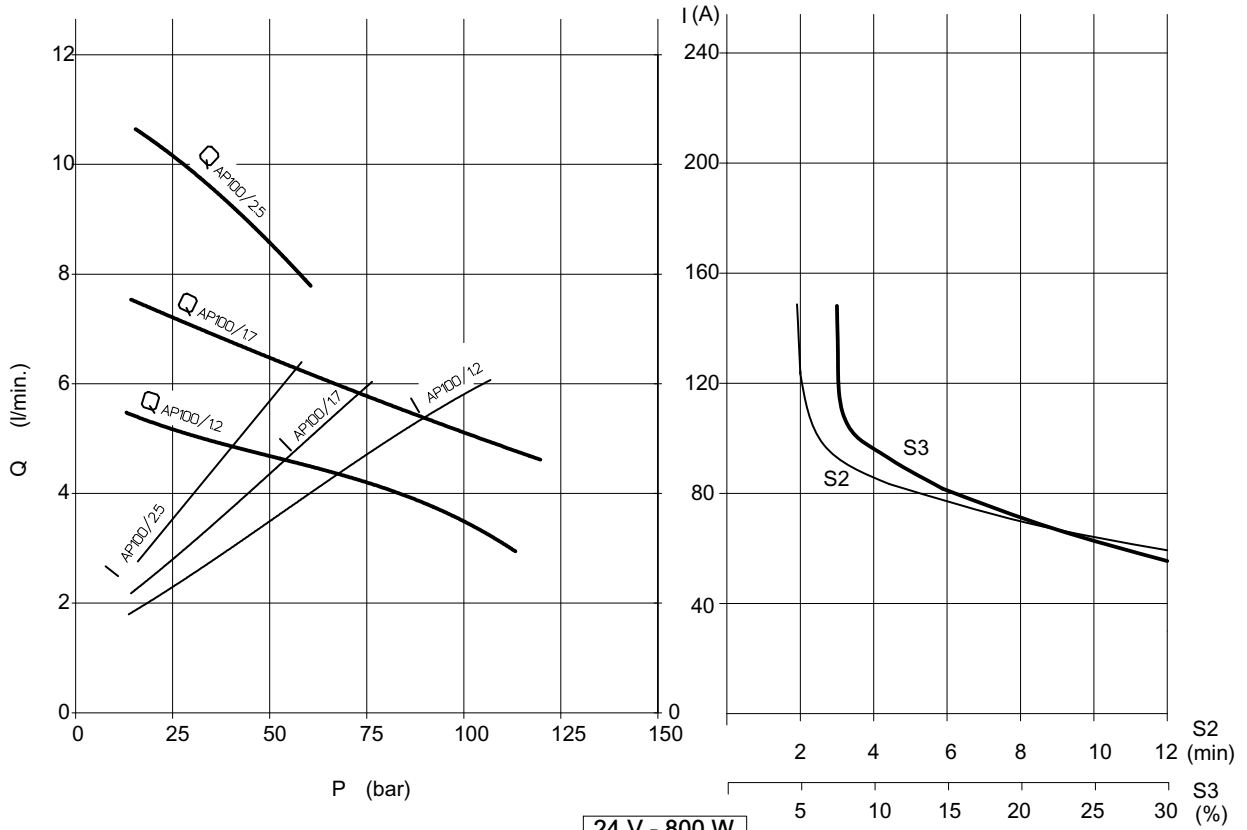
R	2	1	5	F
---	---	---	---	---

Relay mounting positions

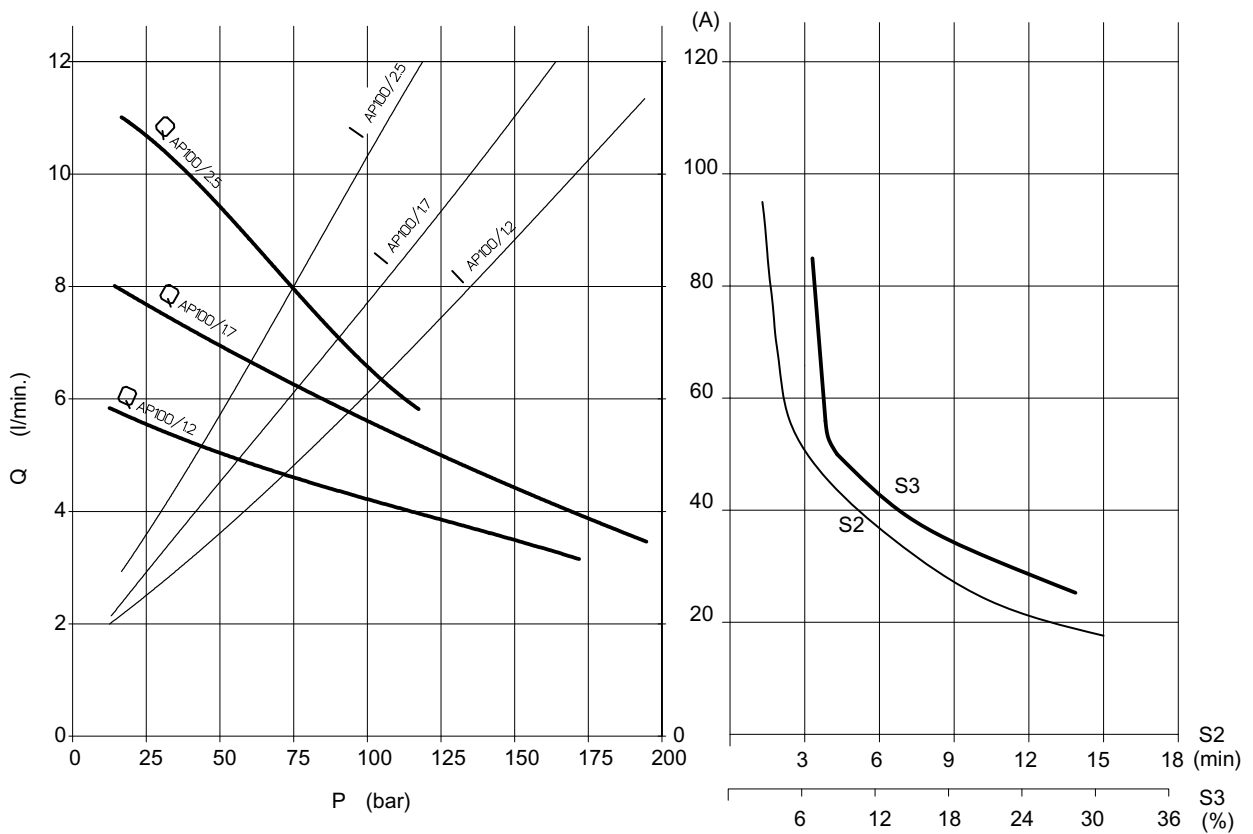
Standard positions



12 V - 800 W

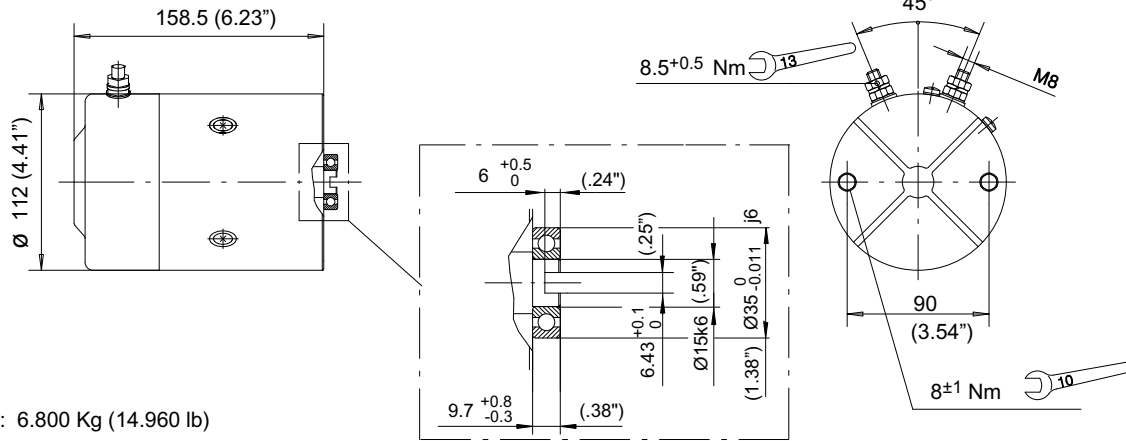


24 V - 800 W



Voltage	Nominal Power
12 V	1600 W
24 V	2200 W

Protection index: IP44
 Insulation class: F
 Type of winding: Compound
 Brushes kit: BK01 (12/1600) 200544138022
 BK02 (24/2200) 200544138023
 Minimum brushes length: 9 mm (0.35 inches)

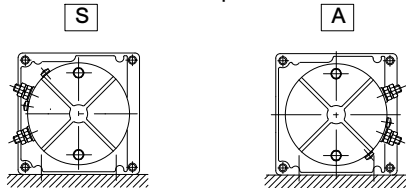


Weight: 6.800 Kg (14.960 lb)

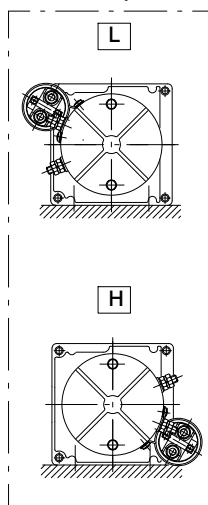
Rotation Right	Motor		Motor with relay		Motor with thermal switch	
Type	C135AB/H0	C240AB/S0	C135AB/H0 +R109	C240AB/S0 +R215	C135AB/HT	C240AB/ST
Code	200543913706	200543924007	200763310240	200763320330	200543913502	200543924008
Relay			Standard			
Relay type			R109	R215		

Motor mounting positions

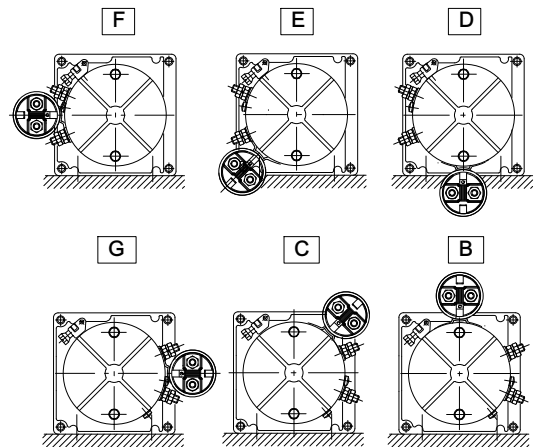
Standard positions



Standard positions

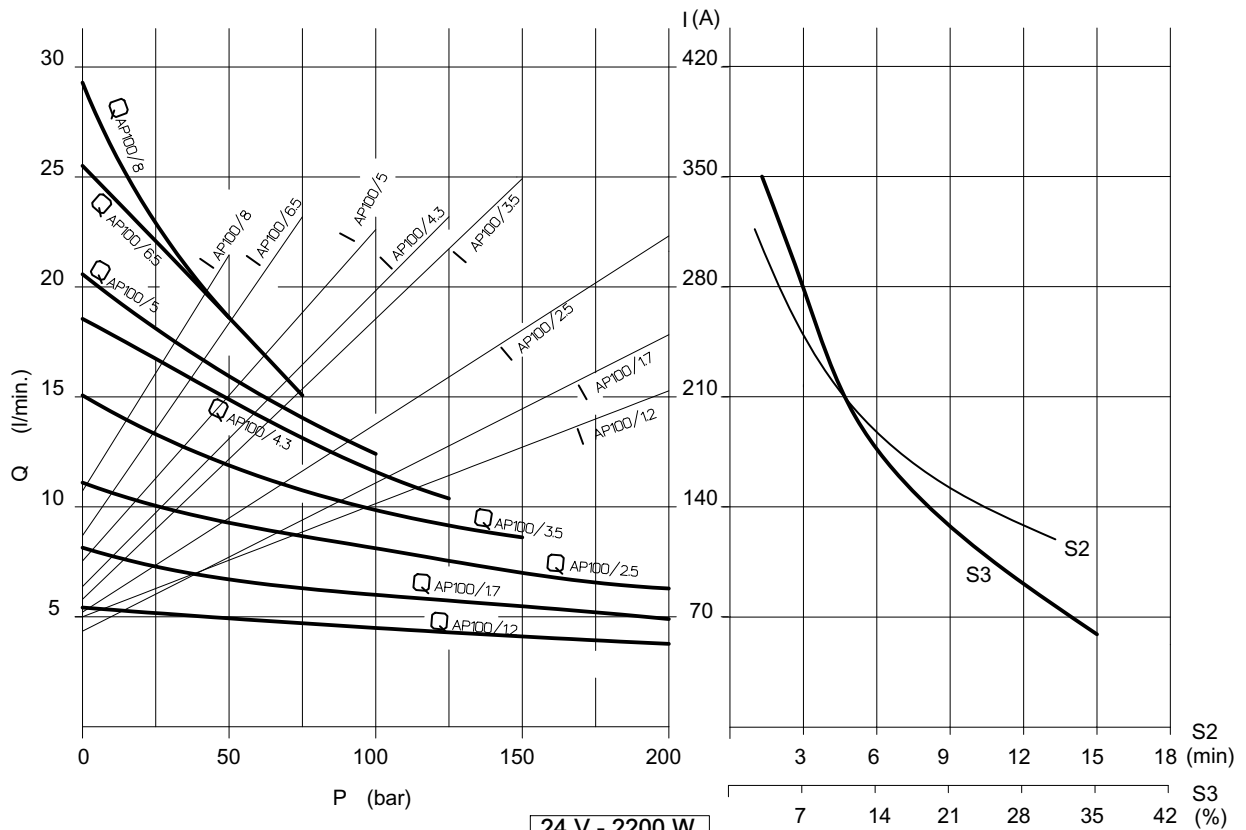


Relay mounting positions

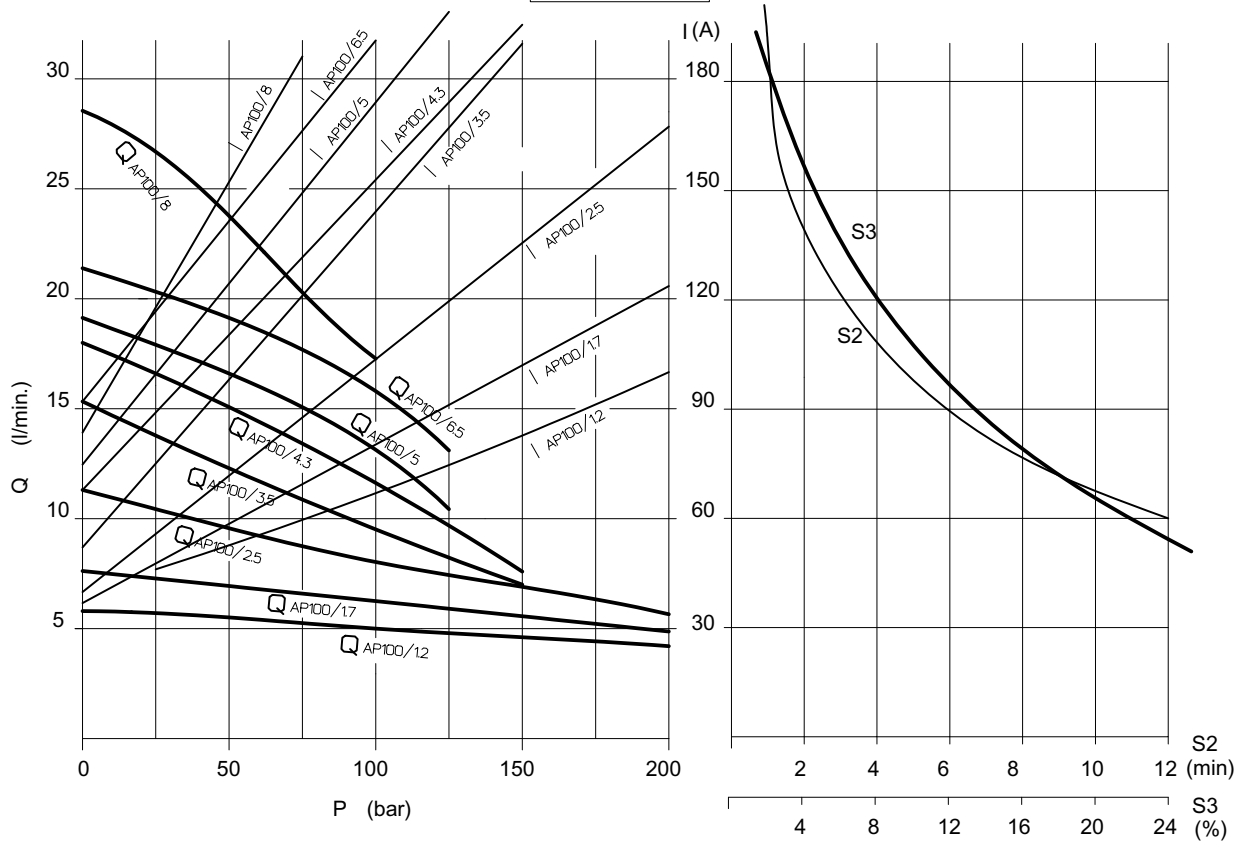


5	C	1	3	5	A	B	/	H	1	S
Example										
	R	1	0	9	L					

12 V - 1600 W

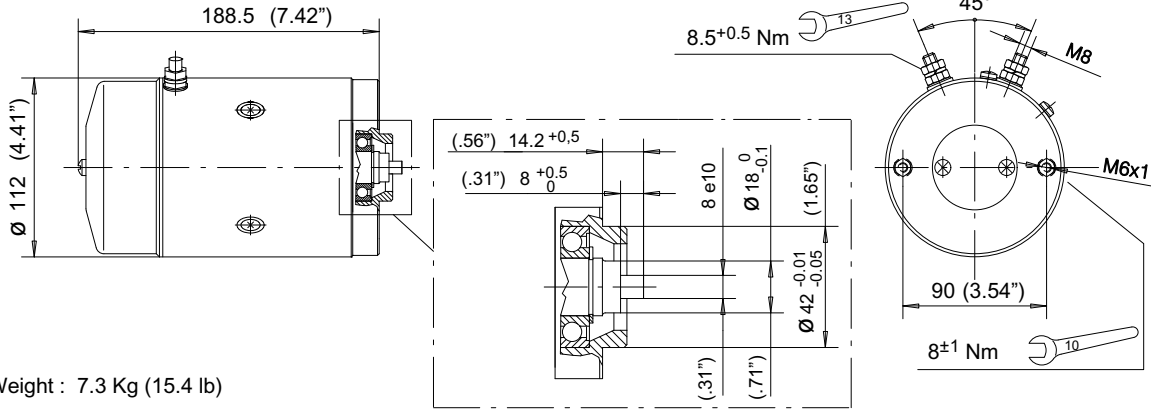


24 V - 2200 W



Voltage	Nominal Power
12 V	1500 W
24 V	2000 W

Protection index: IP44
 Insulation class: F
 Type of winding: Compound
 Brushes kit: BK03 12/1500) 200544138016
 BK04 (24/2000) 200544138015
 Minimum brushes length: 12.5 mm (0.5 inches)

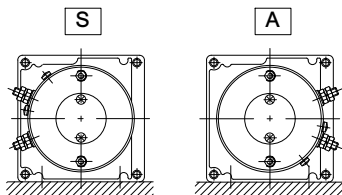


Weight : 7.3 Kg (15.4 lb)

Rotation Right	Motor		Motor with relay	
	12V-1500W	24V-2000W	12V-1500W	24V-2000W
Type	C134AK/O0	C238AK/P0	C134AK/O0 + R109	C238AK/P0 + R215
Code	200543913416	200543923813	200763310260	200763320250
Relay			Standard	
Relay type			R109	R215

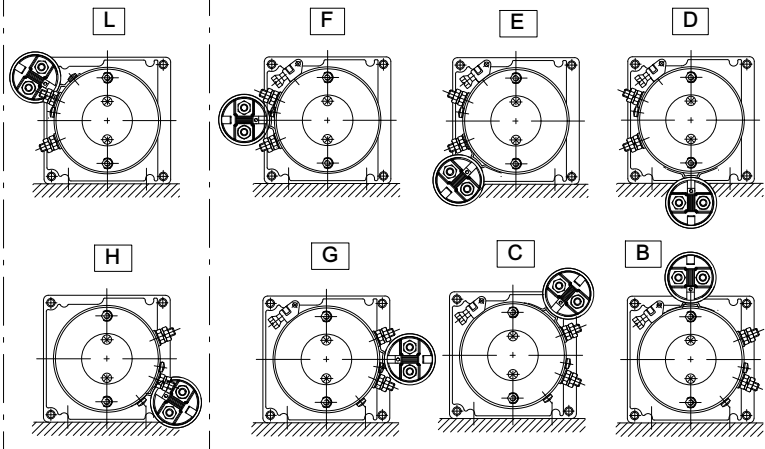
Motor mounting positions

Standard positions



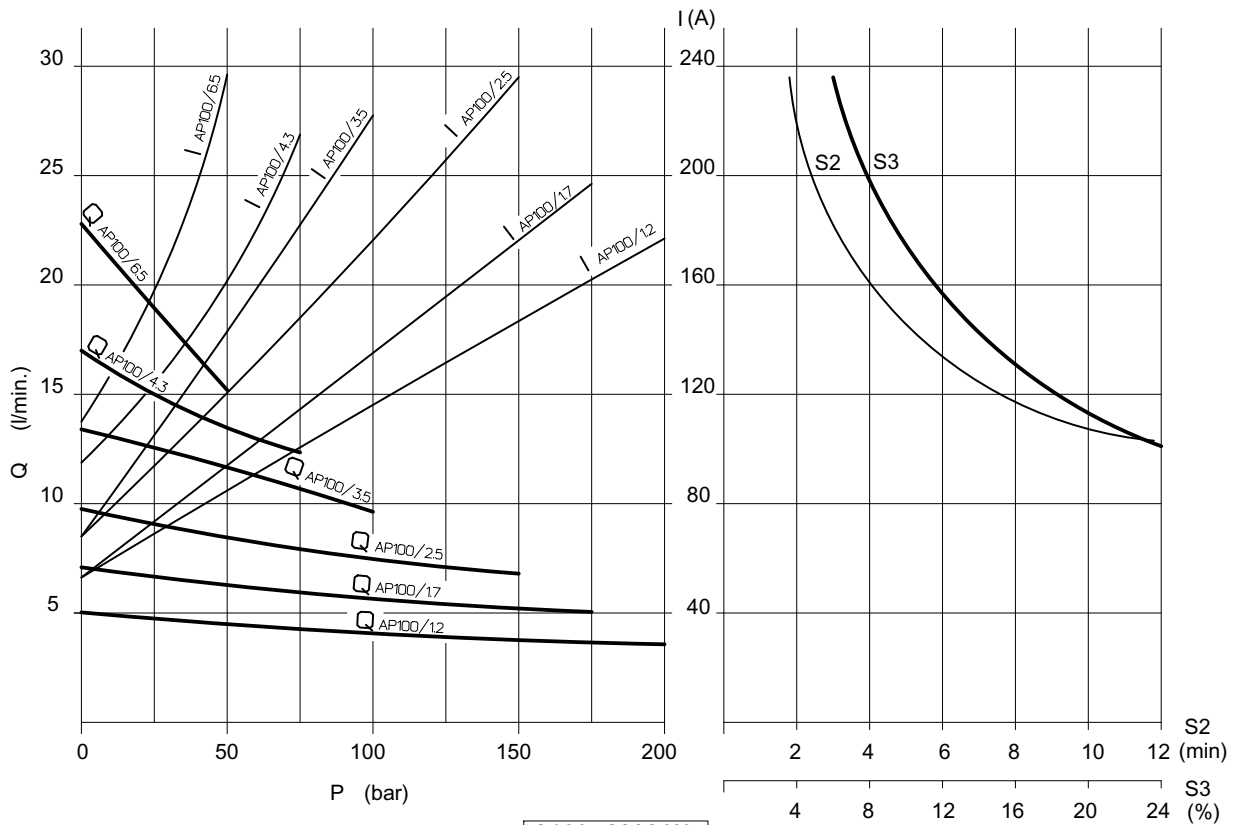
Relay mounting positions

Standard positions

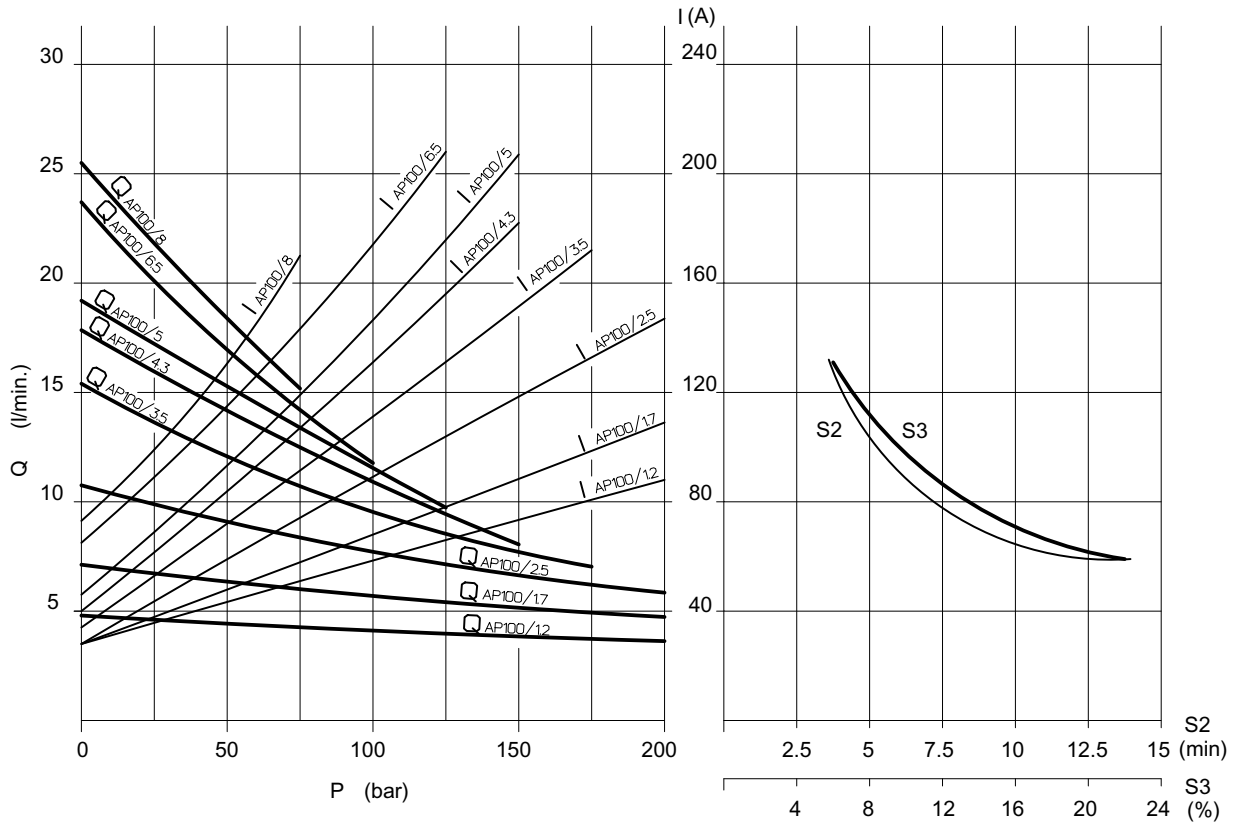


	Electric motor							Pos.		
5	C	1	3	4	A	K	/	O	0	S
Example										
	Relay							Pos.		

12 V - 1500 W

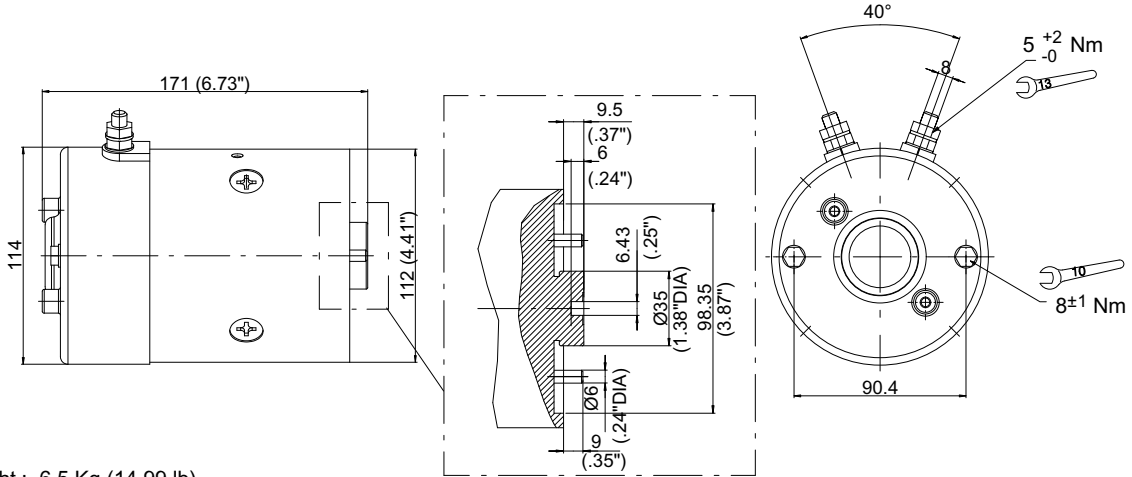


24 V - 2000 W



Voltage	Nominal Power
24 V	2200 W

Protection index: IP54
 Insulation class: B
 Type of winding: SERIE
 Minimum Brushes length: 5 mm (0.2 inches)

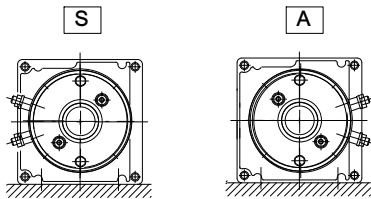


Weight : 6.5 Kg (14.99 lb)

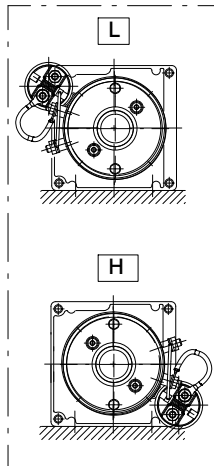
	Motor		Motor with relay	
Rotation Right				
Type	C242AD/F0		C242AD/F0 +R215	
Code	200543924211		200763320340	
Relay			Standard	
Relay type			R109	R215

Motor mounting positions

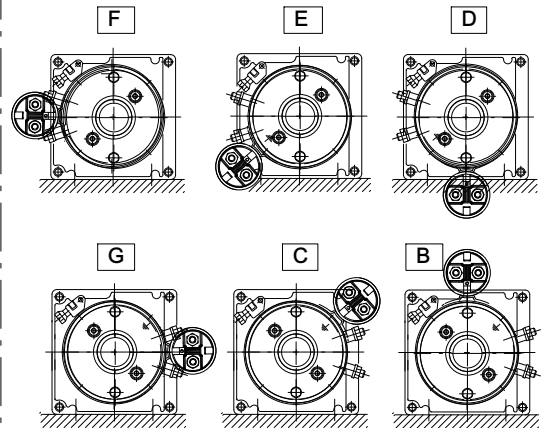
Standard positions



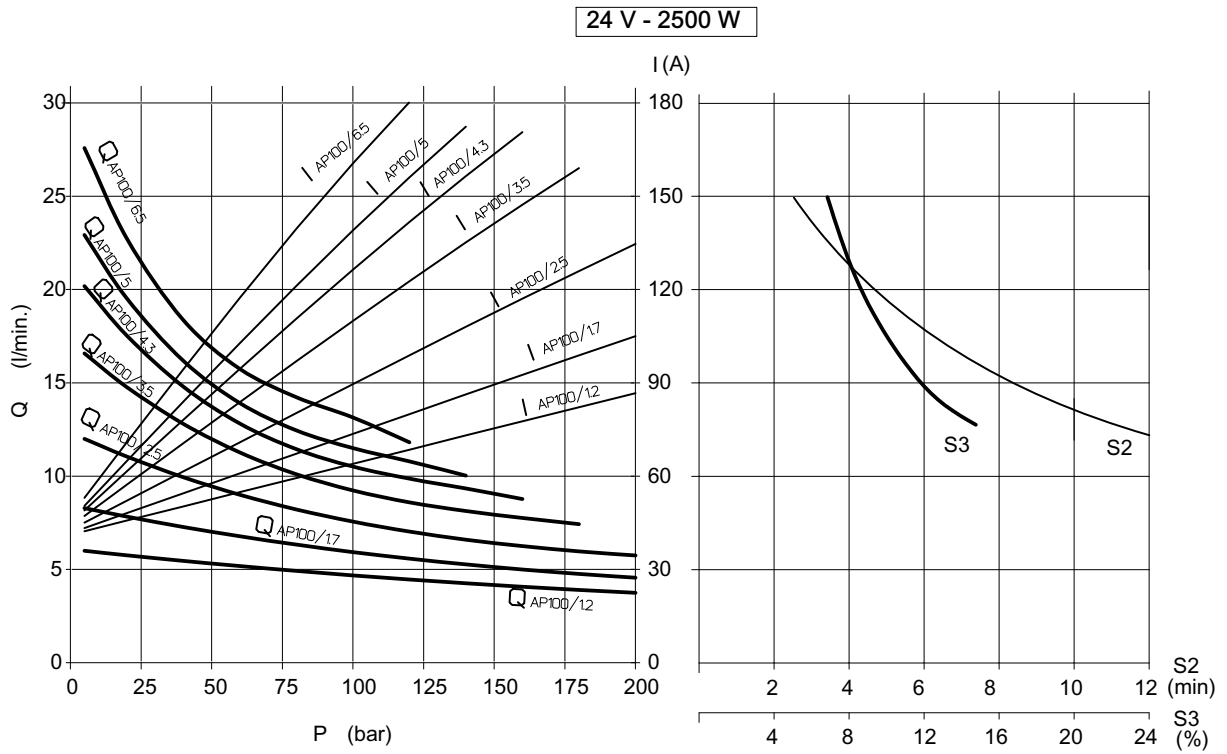
Standard positions



Relay mounting positions

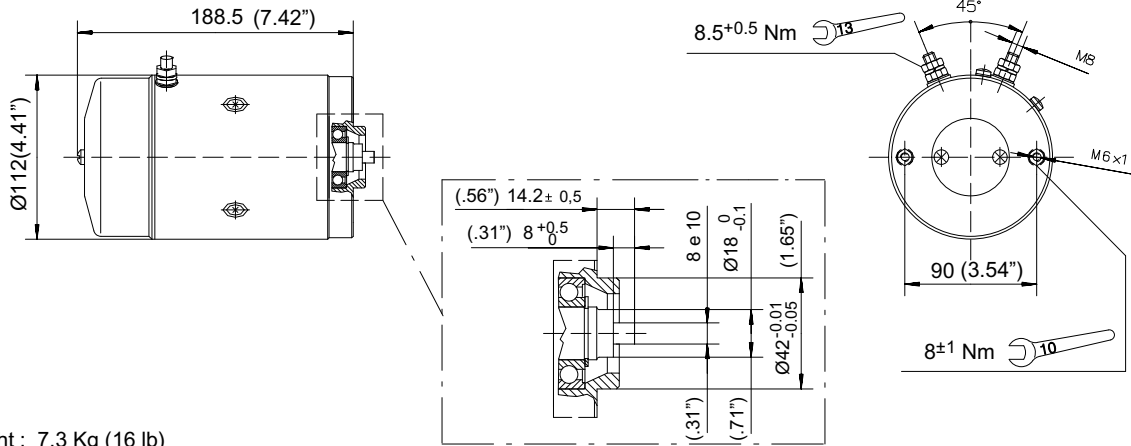


5	Electric motor							Pos.		
	C	2	4	2	A	D	/	F	0	S
Example	Relay							Pos.		
	R	2	1	5				L		

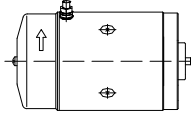


Voltage	Nominal Power
48 V	2000 W

Protection index: IP54
 Insulation class: F
 Type of winding: Compound
 Brushes kit: BK05 200544138018
 Minimum brushes length: 12.5 mm (0.5 inches)

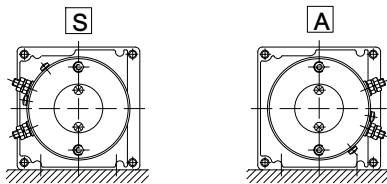


Weight : 7.3 Kg (16 lb)

	Motor	Motor with relay			
Rotation Right					
Type	T82K				
Code	200543933803				
Relay					
Relay type					

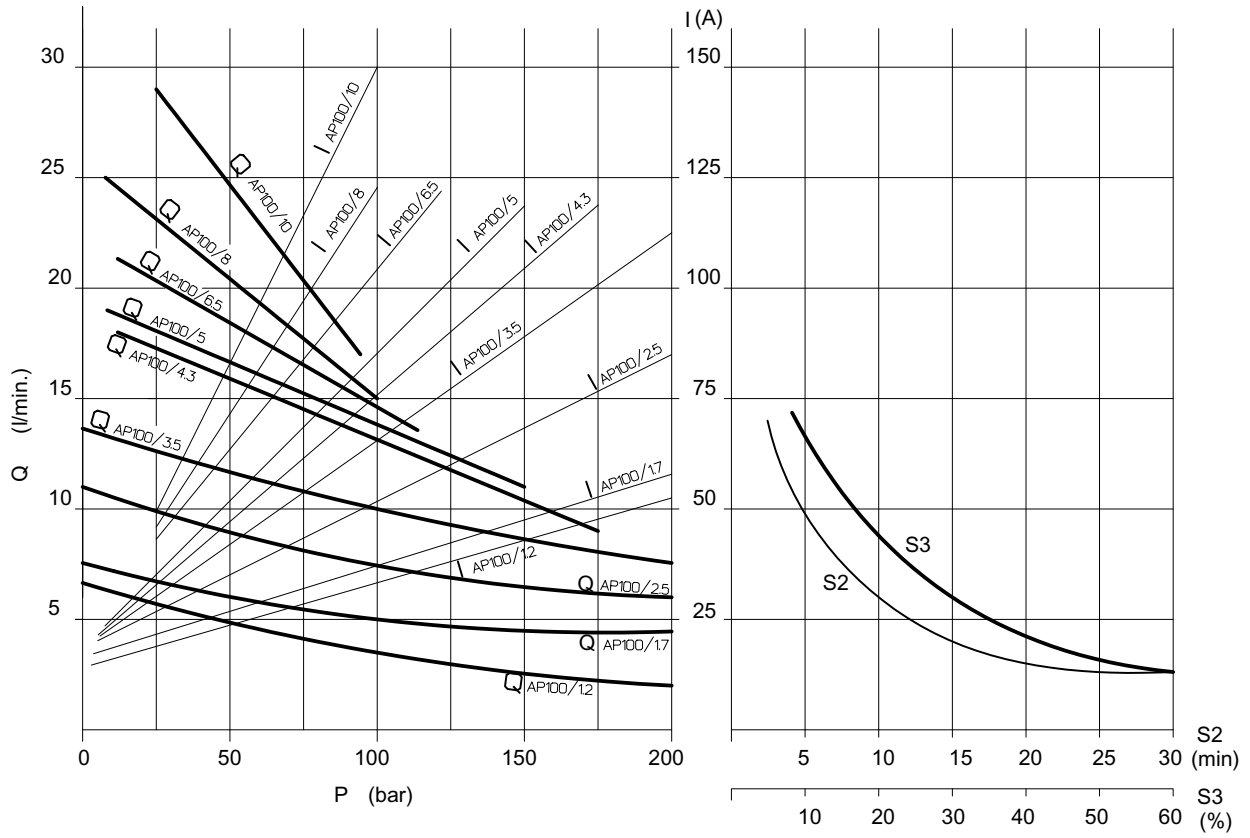
Motor mounting positions

Standard positions



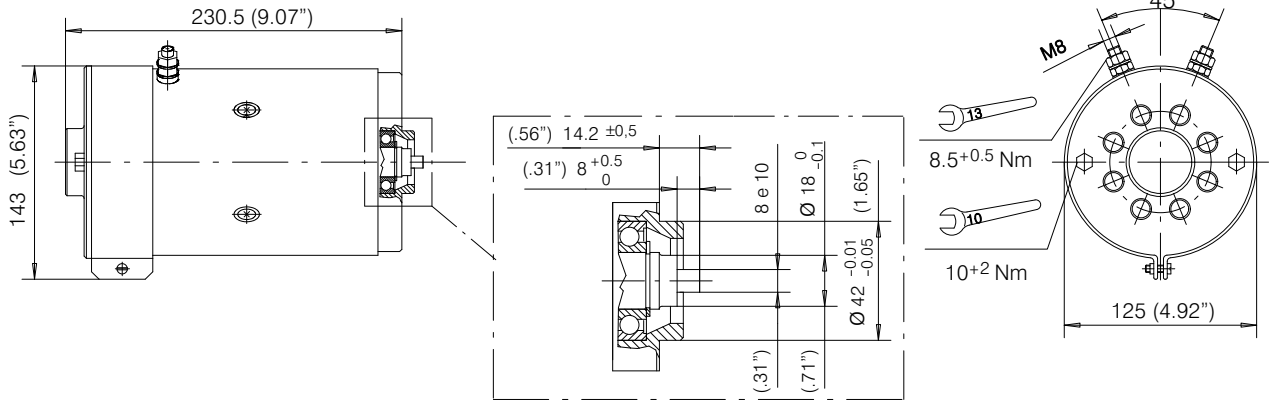
	Electric motor						Pos.
5	T	8	2	K			S
Example	Relay						Pos.

48 V - 2000 W

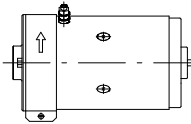



Voltage	Nominal Power
24 V	3000 W

Protection index: IP44
 Insulation class: F
 Type of winding: Compound
 Brushes kit: BK06 200544138011
 Minimum brushes length: 15 mm (0.6 inches)

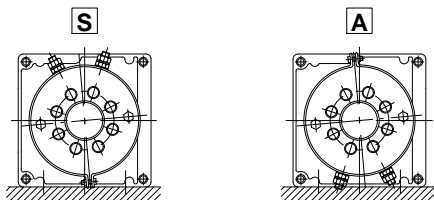


Weight : 12 Kg (26.4 lb)

	Motor	Motor with relay
Rotation Right	 	
Type	24 V - 3000 W	
Code	T106K	
Code	200543924806	
Relay		
Relay type		

Motor mounting position

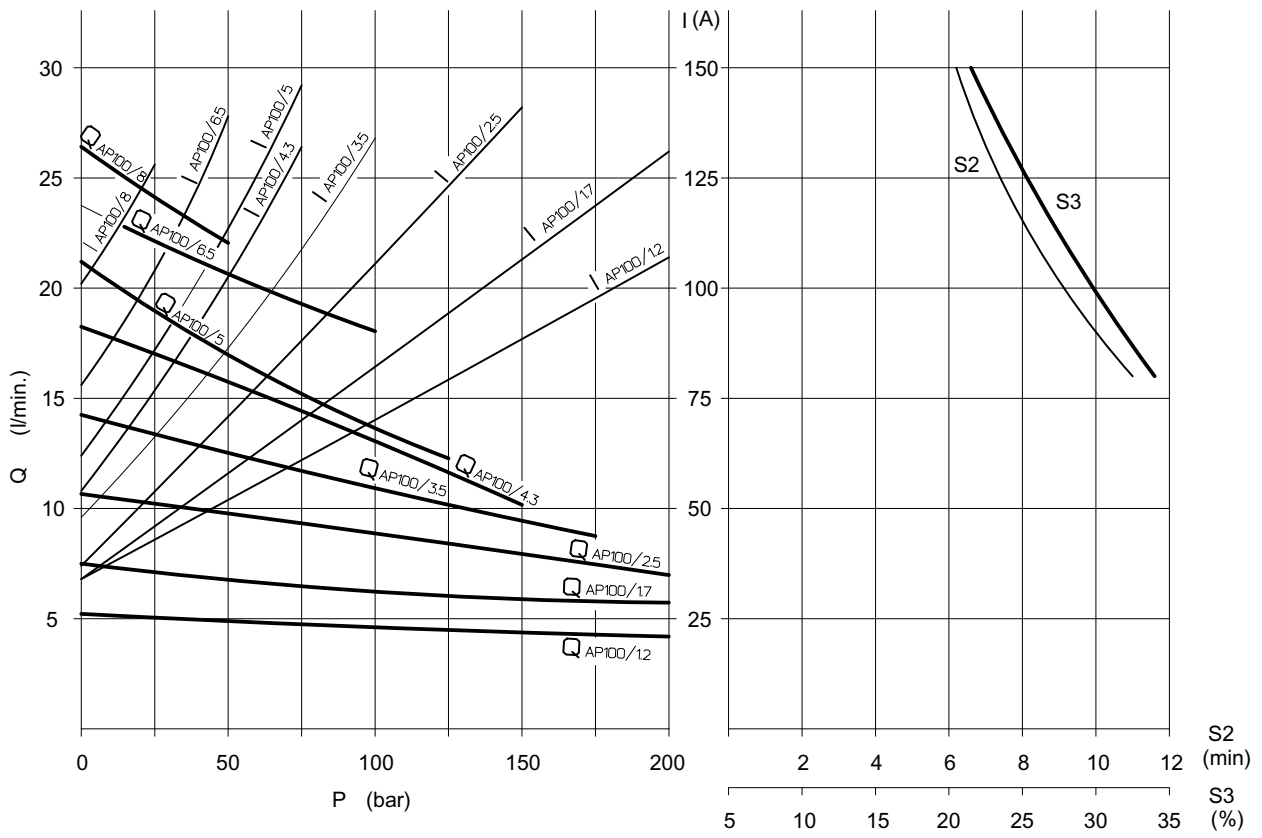
Standard positions



Example

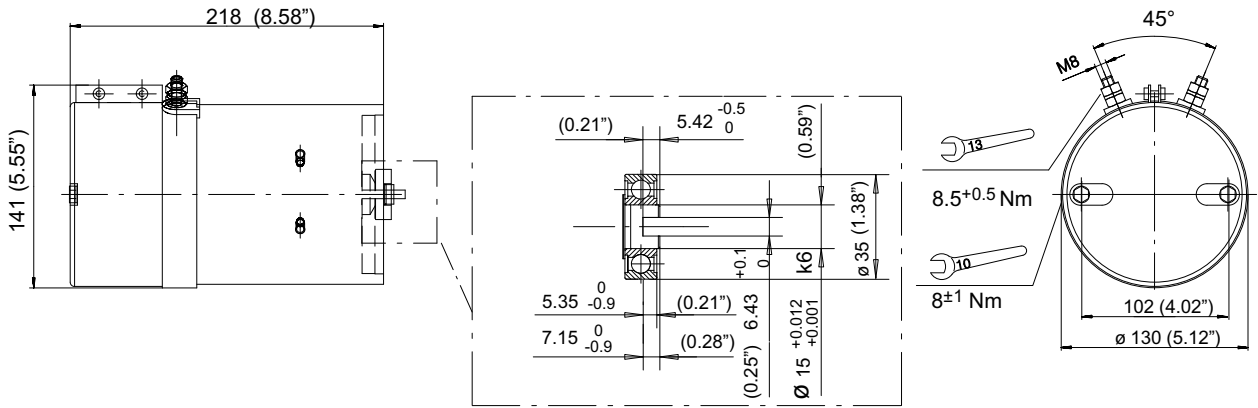
	Electric motor	Pos.	Relay	Pos.
5	T 1 0 6 K	S		

24 V - 3000 W



Voltage	Nominal Power
24 V	3000 W

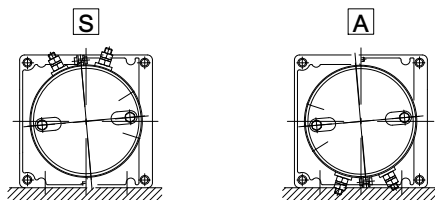
Protection index: IP43
 Insulation class: F
 Type of winding: Compound
 Brushes kit: BK07 200544138029
 Minimum brushes length: 15 mm (0.6 inches)



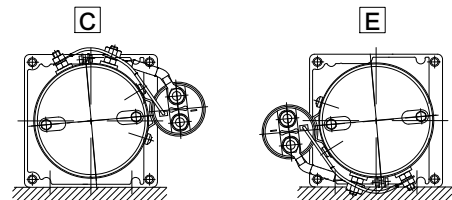
Weight : 12 Kg (26.4 lb)

	Motor	Motor with relay
Rotation		
Right		
Type	24 V - 3000 W	24 V - 3000 W
Code	C248AK/Z0	C248AK/Z1
Code	200543924601	200543924602
Relay		Heavy duty
Relay type		R212
		Standard positions only

Motor mounting position
Standard positions



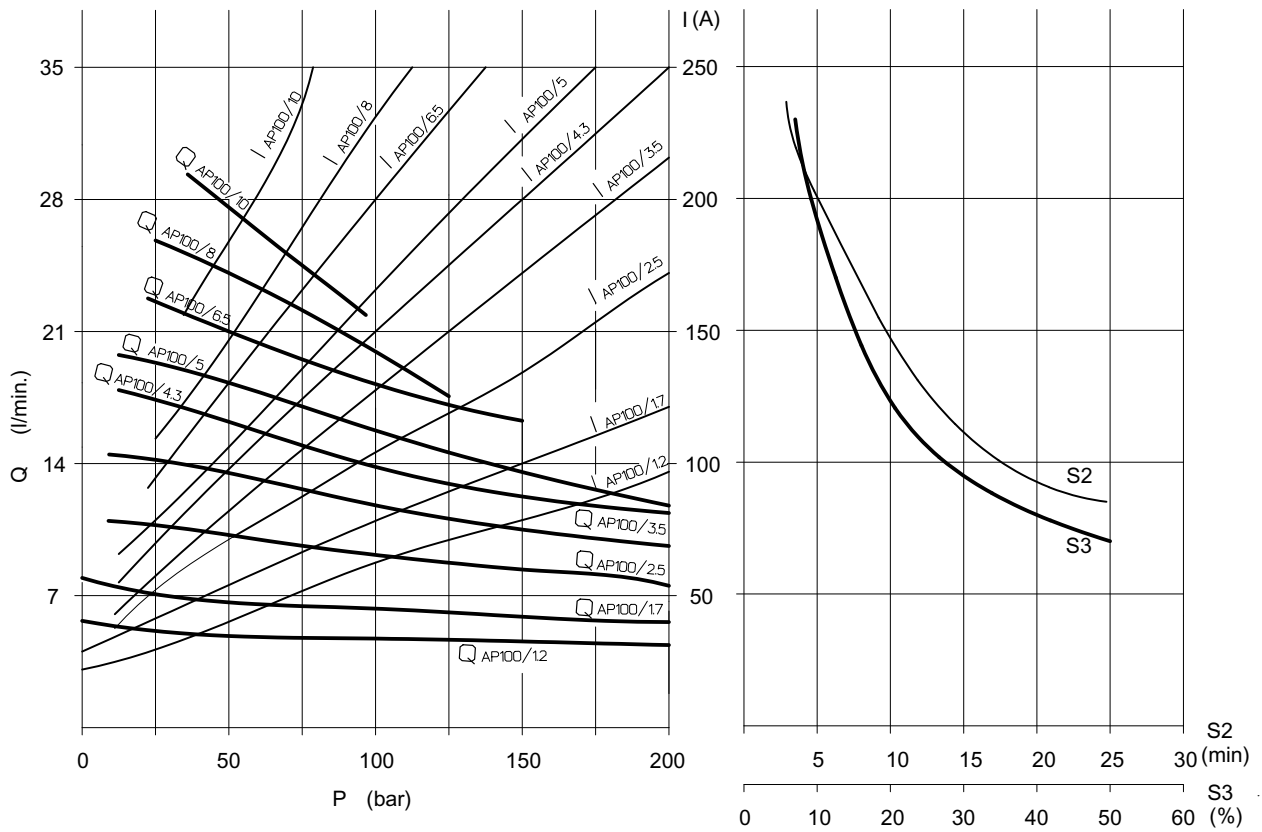
Relay mounting positions
Standard positions



Example

	Electric motor	Pos.	Relay	Pos.
5	C 2 4 8 A K / Z 0	S		

24 V - 3000 W



5.1.4 Starter Relays - Technical information

Versions:

Available voltage: 12-24 V

Standard: suitable for most applications.

Heavy duty: for more arduous conditions

See relative table for technical data for:

- Electrical insulation class

- Type of duty

- Protection factor:

The level of protection is defined according to the same parameters as listed for electric motors.

- Contact life:

The contacts of the relay will wear down progressively during operation.

Since the rate of wear is dedicated by the type of duty and cannot therefore be broadly specified, consult our Sales dept. for guideline information.

Fitment to electric motor

Starter relays can be fitted to the frame of the motor by two different methods:

1. Direct

The relay is secured with screws, using holes already tapped in motor frame. In this instance there is one standard mounting position only.

2. Metal clip

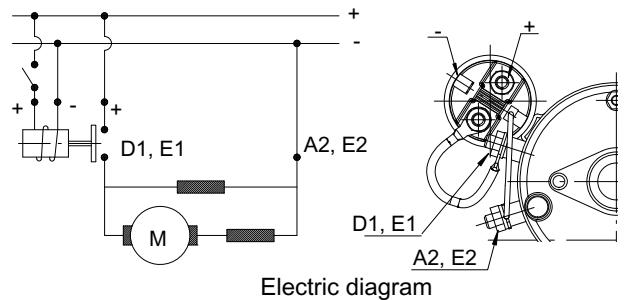
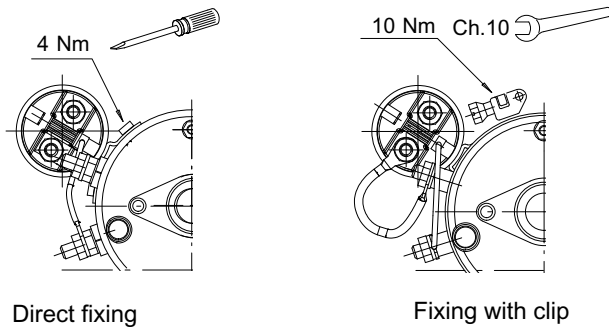
Suitable for standard relays only.

The relay is secured by means of a clip encircling the motor frame and inserted through special slots in the feet of the relay itself.

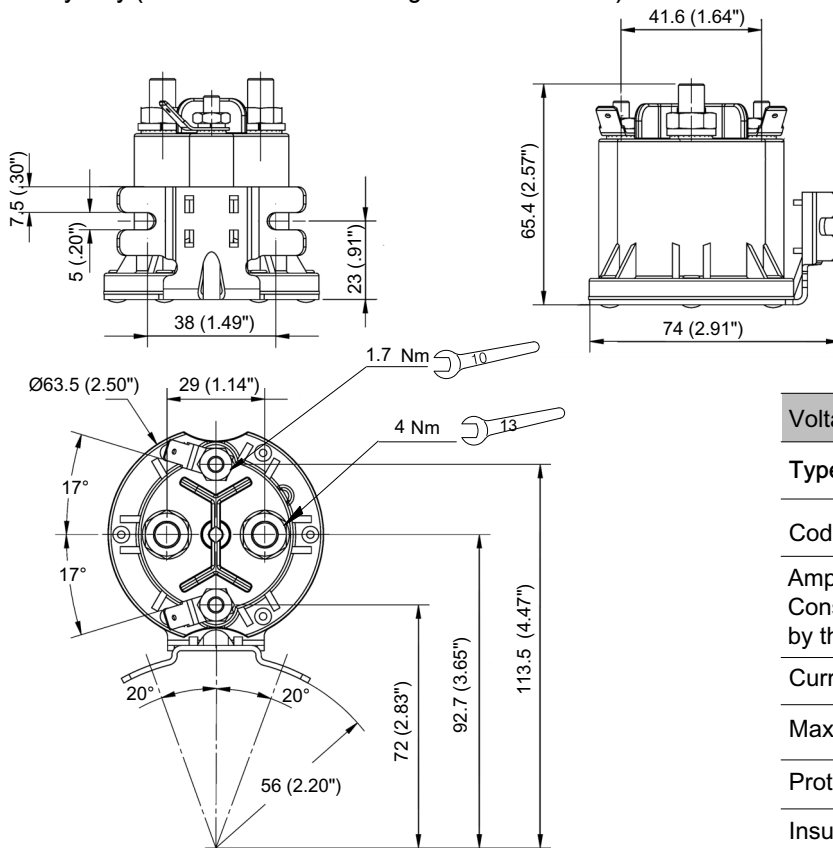
In this instance, several mounting positions are possible.

Electrical diagram

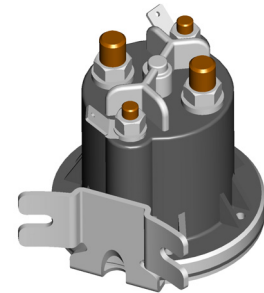
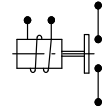
A typical arrangement for connection of the relay to the electric motor is shown in the diagram.



Heavy duty (STANDARD for wide range of DC el. motors)



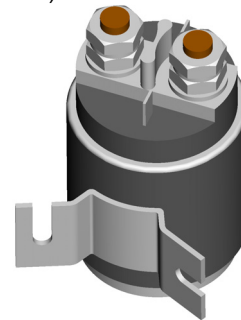
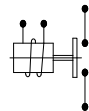
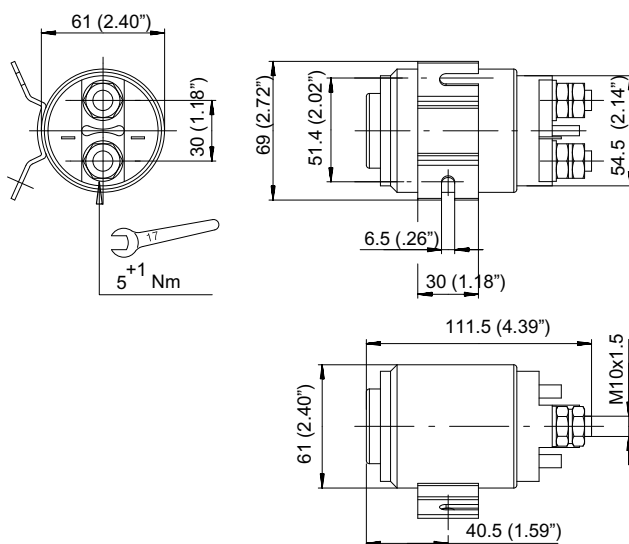
Weight: 0.37 kg



Voltage	12 V	24 V
Type	R109	R215
Code	200544134109	200544134215
Amps Consumption by the coil	2.2 A	1.2 A
Current for continuous duty		150 A
Max. current (5 sec.)		800 A
Protection index		IP66
Insulation class		F

Heavy duty (3000 W. el. motors)

Weight : 1.268 Kg (2.75 lb)



Voltage	24 V
Type	R212
Code	200544134212
Amps Consumption by the coil	1.1 A
Current for continuous duty	300 A
Protection index	IP42
Insulation class	B

5.2 A.C. Motors

5.2.1 Technical information

Versions:

Electric motors supplied by Bucher Hydraulics S.p.A. respond to European Standard EN60034-1 (IEC-3, CEI2-3, VDE 0530T1).

Available power ratings: 0.25 ÷ 4 kW

Single phase motor: 230V ±5% - 50 Hz

Three phase motor: 230/400V ±10% - 50 Hz

European standard IEC38 (1983) envisages the unification of supply voltages, adopting 230 V for single phase and 400 V for three phase. Motors responding to this standard are available only by request: consult our Bucher Hydraulics.

Protection factor

Standard electric motors are specified:

Protection degree: IP54 (IP55 on request)

Insulation class: F (max 105°).

Type of duty

All motors can be supplied rated for continuous duty S1 or intermittent duty S3<80%.

With respect to the European Standard IEC 60034-30:2008 all motors rated for continuous duty S1, will be manufactured according to IE2 Efficiency class

Efficiency class:

All motors respond to European standard IEC 60034-30:2008. This means all the motors between 0,75 kW and 375 kW both 2 and 4 poles, rated for continuous duty S1 or intermittent duty S3≥ 80%, are in IE2 Efficiency class.

Speed of rotation

The nominal speed of rotation for A.C. motors is calculated by the following formula: $n = (60 \cdot f) / P$

f= frequency (50 Hz for EU / 60 Hz for USA)

P= pair of poles

A 4 poles motor has 1500 rev/min as nominal speed

Pole number:

Indicated motors are 4 pole type, but Bucher Hydraulics S.p.A. can supply 2 pole motors too.

Please ask Bucher Hydraulics.

Size

The size designation gives the main dimensions for the standard electric motors: shaft dimensions, type of flange, max diameter, etc. A specific table shows the essential dimensions corresponding to each standard size.

The electric motors with direct flange have their own dimensions especially the front flange.

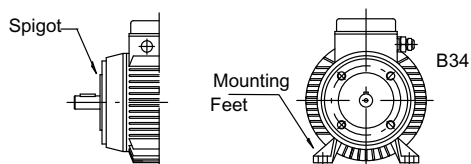
Frame size

Standard option:

Standard motors have B34 frame so mounting flange with spigot, tapped fixing holes and motor fixing feet.

B14 frame is also available on request

Direct flange motors are delivered without fixing feet (B14 style).



Ventilation:

All the motors (standard and direct flange) can be available with or without ventilation. Normally the direct flange motors are delivered without ventilation.

Important to say that motors without ventilation can not be rate for continuous duty S1.

Paint finish

All motors are aluminum alloy die cast not painted.

Starting single phase motors

Standard single phase motors have a permanently connected run capacitor. Where starts are made on-load or in especially heavy-duty condition, requiring a starting torque higher than the nominal torque, single phase induction motors can be supplied, by request, with a dual capacitor arrangement: a start capacitor, disconnected by an automatic cutout once the motor is up to speed, and a permanently connected run capacitor, or hydraulic circuit with decompression valve assembled on the pump.

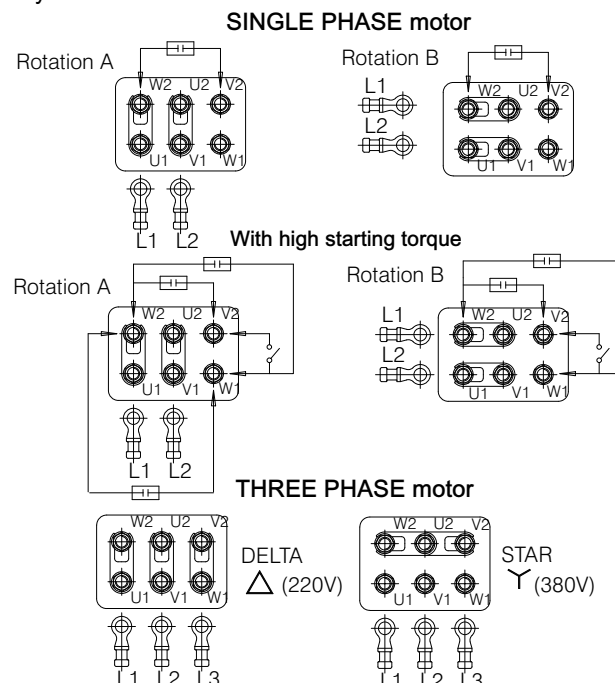
Please consult Bucher Hydraulics.

Electrical diagrams

The following illustration shows a number of connection diagrams for single phase and three phase electric motors.

The terminal boxes used for these motors respond to NFC 51-118 (IEC34-8) and have 6 power terminals.

A terminal is also provided for the earth wire, which must always be connected

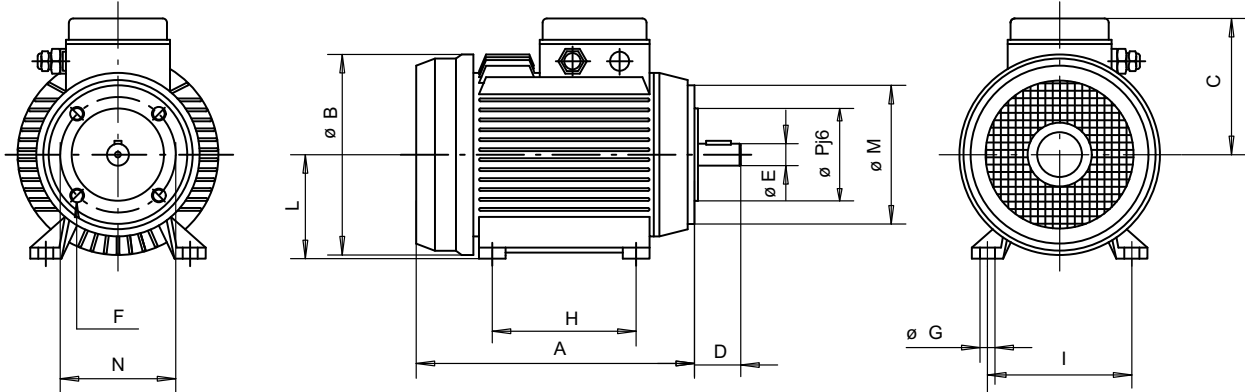


Three phase motors: with terminals U1-V1-W1 connected respectively to phases L1-L2-L3 of supply, the motor will rotate clockwise (as viewed from the shaft end).

Bucher Hydraulics S.p.A. is not an electric motors manufacturer so these components come from third part. Bucher Hydraulics S.p.A. reserves the right to change the motor supplier without notice whenever considers it necessary. Minor dimensional and cosmetic differences may exist.

5.2.2 Standard interface (flange/drive needed)

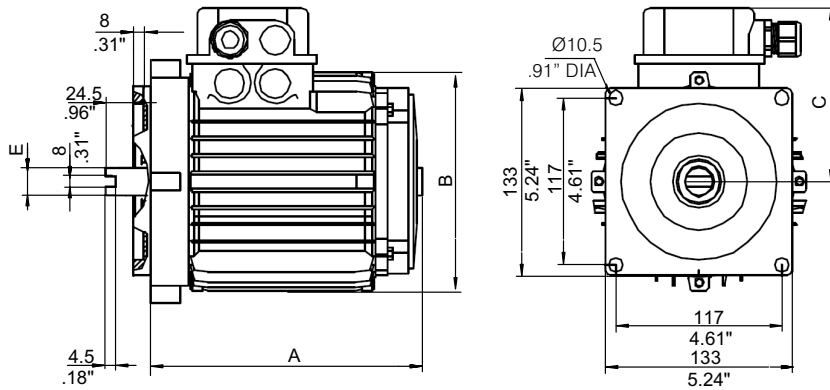
Frame size B34



Size	Units	Dimensions												
		A	B	C	D	E	F	G	H	I	L	M	N	P
71	mm	218	140	109	30	14	M6	7	90	112	71	105	85	70
	inch	8.58	5.51	4.29	1.18	0.55		0.27	3.54	4.41	2.79	4.13	3.35	2.76
80	mm	237	156	123	40	19	M6	9	100	125	80	120	100	80
	inch	9.33	6.14	4.84	1.57	0.75		0.35	3.94	4.92	3.15	4.72	3.94	3.15
90S	mm	255	178	128	50	24	M8	9	100	140	90	140	115	95
	inch	10.04	7	5.04	1.97	0.94		0.35	3.94	5.51	3.54	5.51	4.53	3.74
90L	mm	279	178	128	50	24	M8	9	125	140	90	140	115	95
	inch	11	7	5.04	1.97	0.94		0.35	4.92	5.51	3.54	5.51	4.53	3.74
100	mm	309	194	137	60	28	M8	12	140	160	100	160	130	110
	inch	12.16	7.64	5.40	2.36	1.1		0.47	5.51	6.3	3.94	6.3	5.12	4.33
112	mm	331	219	50	60	28	M8	12	140	190	112	160	130	110
	inch	13.03	8.62	1.97	2.36	1.1		0.47	5.51	7.48	4.41	6.3	5.12	4.33

Note: Indicated dimensions can vary without notice within the maximum admitted by the European Standards IEC72-1 and IEC34-7.

5.2.3 Direct flange (simple drive needed)



Size	Units	Dimensions			
		A	B	C	E
71	mm	183	136	122	17
	inch	7.20"	5.35"	4.80"	.67"
80	mm	198	154	143	17
	inch	7.80"	6.06"	5.63"	.67"
90S	mm	213	174	148	25
	inch	8.39"	6.85"	5.82"	.98"
90L	mm	237	174	148	25
	inch	9.33"	6.85"	5.82"	.98"

5.2.4 Standard interface 4 pole - 50 Hz - 230 V

Frame size B14 SINGLE PHASE				
Power		Size	Type	Code
kW	HP			
0.25	0.33	71	T209	200543161221
0.37	0.5	71	T201	200543161823
0.55	0.75	80	T202	200543162231
0.75	1	80	T203	200543162631
1.1	1.5	90S	T204	200543163041
1.5	2	90L	T205	200543163441
2.2	3	100	T206	200543164051

Frame size B34 SINGLE PHASE				
Power		Size	Type	Code
kW	HP			
0.25	0.33	71	T709	200543161223
0.37	0.5	71	T701	200543161822
0.55	0.75	80	T702	200543162233
0.75	1	80	T703	200543162633
1.1	1.5	90S	T704	200543163042
1.5	2	90L	T705	200543163442
2.2	3	100	T706	200543164052

5.2.5 Standard interface 4 pole - 50 Hz - S3=70% - 230/400 V

Frame size B14 THREE PHASE				
Power		Size	Type	Code
kW	HP			
0.25	0.33	71	T009	200543561221
0.37	0.5	71	T001	200543561821
0.55	0.75	80	T002	200543562231
0.75	1	80	T003	200543562631
1.1	1.5	90S	T004	200543563041
1.5	2	90L	T005	200543563441
2.2	3	100	T006	200543564051
3	4	100	T007	200543564851
4	5.5	100	T008	200543565061

Frame size B34 THREE PHASE				
Power		Size	Type	Code
kW	HP			
0.25	0.33	71	T509	200543561222
0.37	0.5	71	T501	200543561822
0.55	0.75	80	T502	200543562232
0.75	1	80	T503	200543562632
1.1	1.5	90S	T504	200543563042
1.5	2	90L	T505	200543563442
2.2	3	100	T506	200543564052
3	4	100	T507	200543564852
4	5.5	100	T508	200543565062

5.2.6 Direct flange 4 pole -50 Hz - S3=30% - 230 V

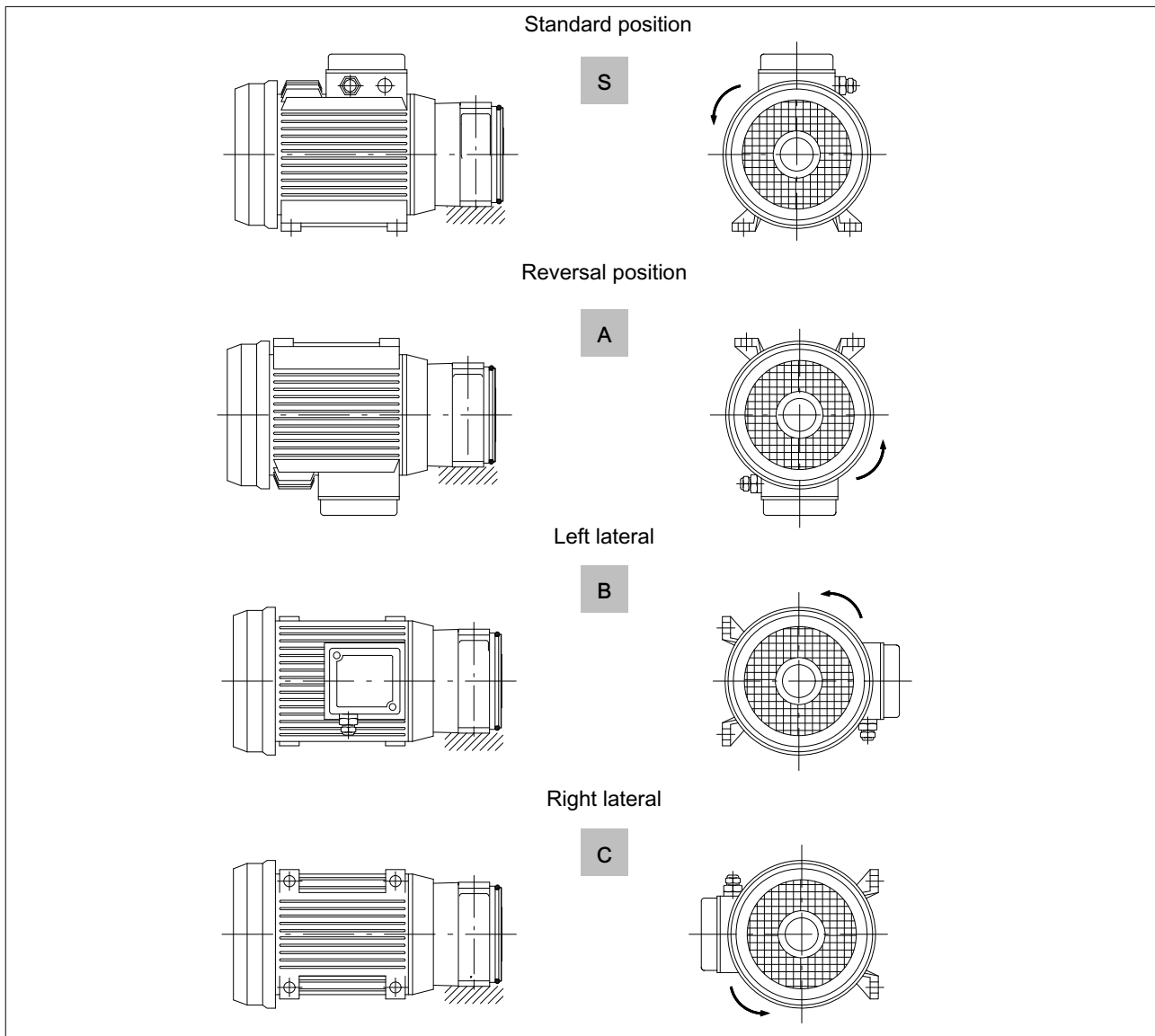
Frame size B14 style SINGLE PHASE				
Power		Size	Type	Code
kW	HP			
1.5	2	90*	TC05	200543163443
2.2	3	90*	TC06	200543164054

5.2.7 Direct flange 4 pole -50 Hz - S3=30% - 230/400

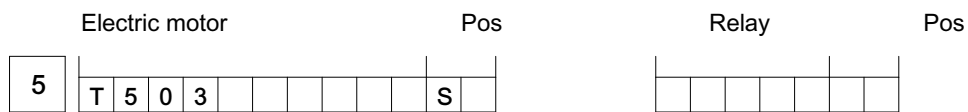
Frame size B14 style THREE PHASE				
Power		Size	Type	Code
kW	HP			
1.5	2	80*	TA05	200543563452
2.2	3	90*	TA06	200543564059

* As reference only: special sizes not included in the European Standards IEC72-1 and IEC34-7

Mounting position



Example



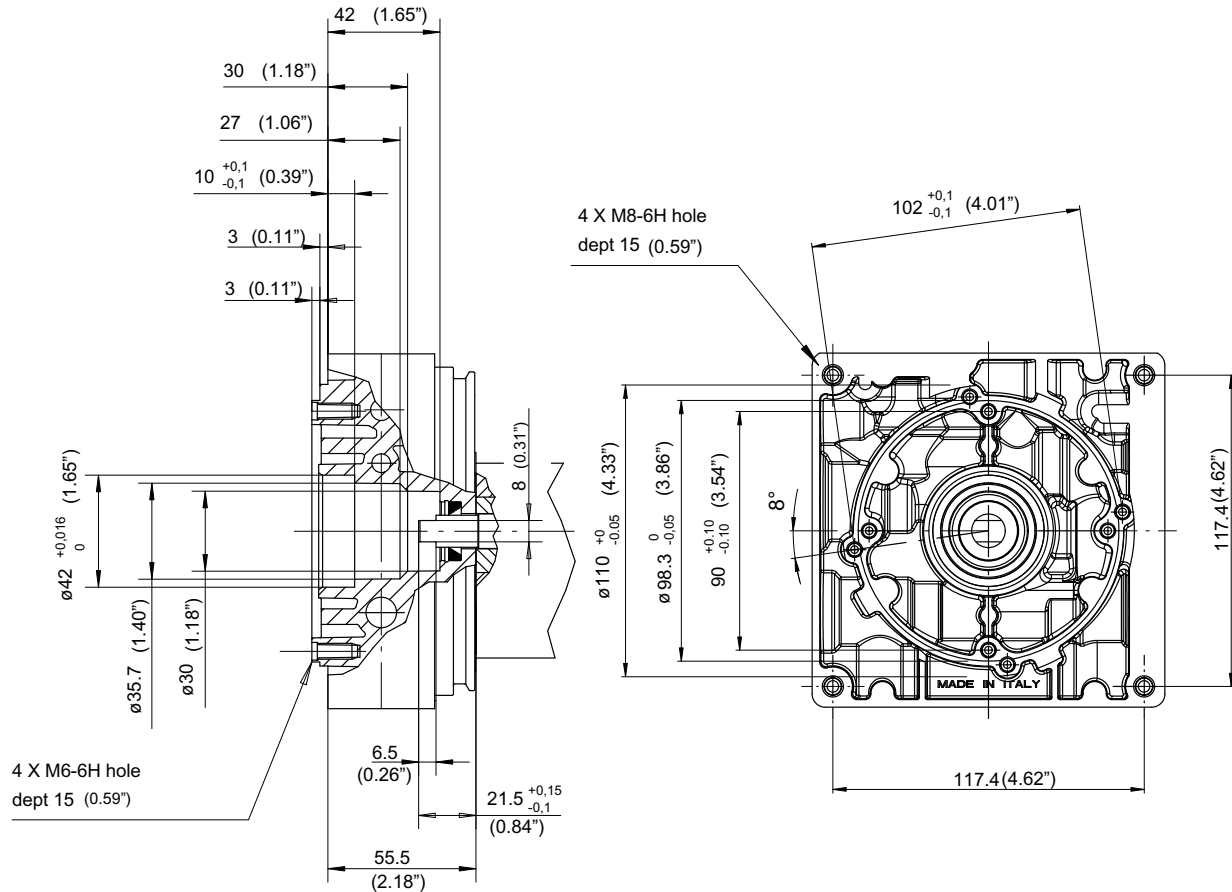
N.B.: Looking at the fan side the e. motor must rotate counterclockwise

6 Drives

6.1 Introduction

The drives illustrated in this chapter are intended for use in conjunction with D.C. and A.C. motors as described in the previous chapter.

To allow the use of different motors, the interface on the motor side is shown with the dimensions of the spigot and of the end of the pump drive shaft.



6.1.1 Materials

The flanges for connection of the power pack housing and electric motor are in aluminium alloy GdAlSi12Cu to EN-AB 46100 (UNI5076).

Couplings are high strength steel, with mating surfaces hardened by heat treatment for added resistance to wear.

6.1.2 Drives for D.C. motors

The tables allow selection of the correct drive for then selected motor.

Motor type		Voltage	Power	Drive
C135AB/H0	C135AB/H0 + R109	12 V	1600 W	E145
C240AB/S0	C240AB/S0 + R215	24 V	2200 W	
C242AD/F0	C242AD/F0 + R215	24 V	2200 W	
C248AK/Z0	C248AK/Z1	24 V	3000 W	
C134AK/O0	C134AK/O0 + R109	12 V	1500W	E156
C238AK/P0	C238AK/P0 + R215	24 V	2000 W	
T82K		48 V	2000 W	
T106K		24 V	3000 W	
C128PK/A0	C128PK/A0 + R109	12 V	800 W	E163
C228PK/A0	C228PK/A0 + R215	24 V	800 W	

6.2 Drives for A.C. motors

6.2.1 Single phase

Motor type	Power		Size	Drive
	kW	HP		
T209-T709	0.25	0.33	71	E133
T201-T701	0.37	0.5		
T202-T702	0.55	0.75	80	E131
T203-T703	0.75	1		
T204-T704	1.1	1.5	90S	E132
T205-T705	1.5	2	90L	
T206-T706	2.2	3	100	E137

6.2.2 Three phase

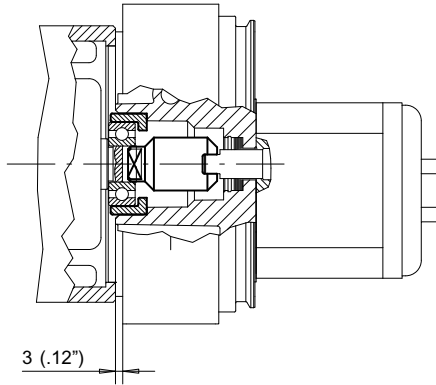
Motor type	Power		Size	Drive
	kW	HP		
T009-T509	0.25	0.33	71	E133
T001-T501	0.37	0.5		
T002-T502	0.55	0.75	80	E131
T003-T503	0.75	1		
T004-T504	1.1	1.5	90S	E132
T005-T505	1.5	2	90L	
T006-T506	2.2	3	100	E137
T007-T507	3	4		
T008-T508	4	5.5	112	

6.2.3 Direct flange

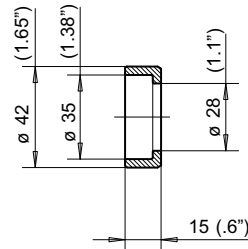
Motor type	Power		Size	Drive code
	kW	HP		
TA05	1.5	2	80	
TC05			90*	
TC06 - TA06	2.2	3	90*	

6.3 Drive E145

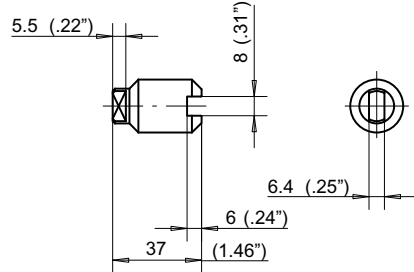
Code E145 200960400400



Bush code
200658200061

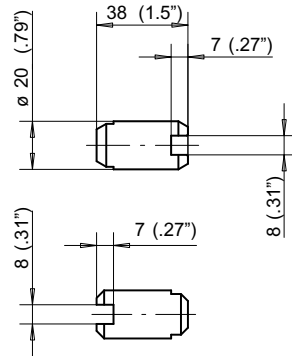
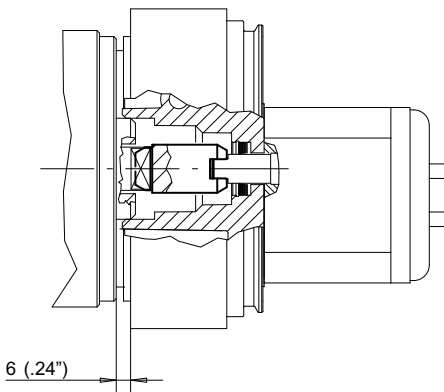


Coupling code
200659600290



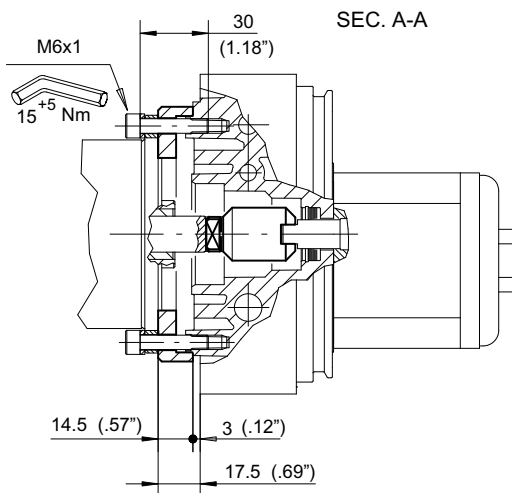
6.4 Drive E156

Code E156 200659600280

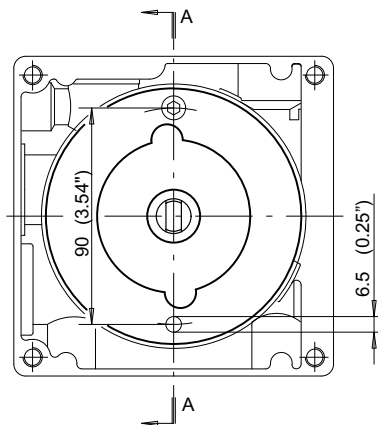


6.5 Drive E163

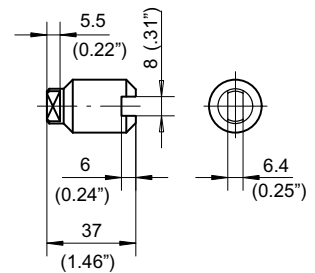
Code E163 200960400410



SEC. A-A

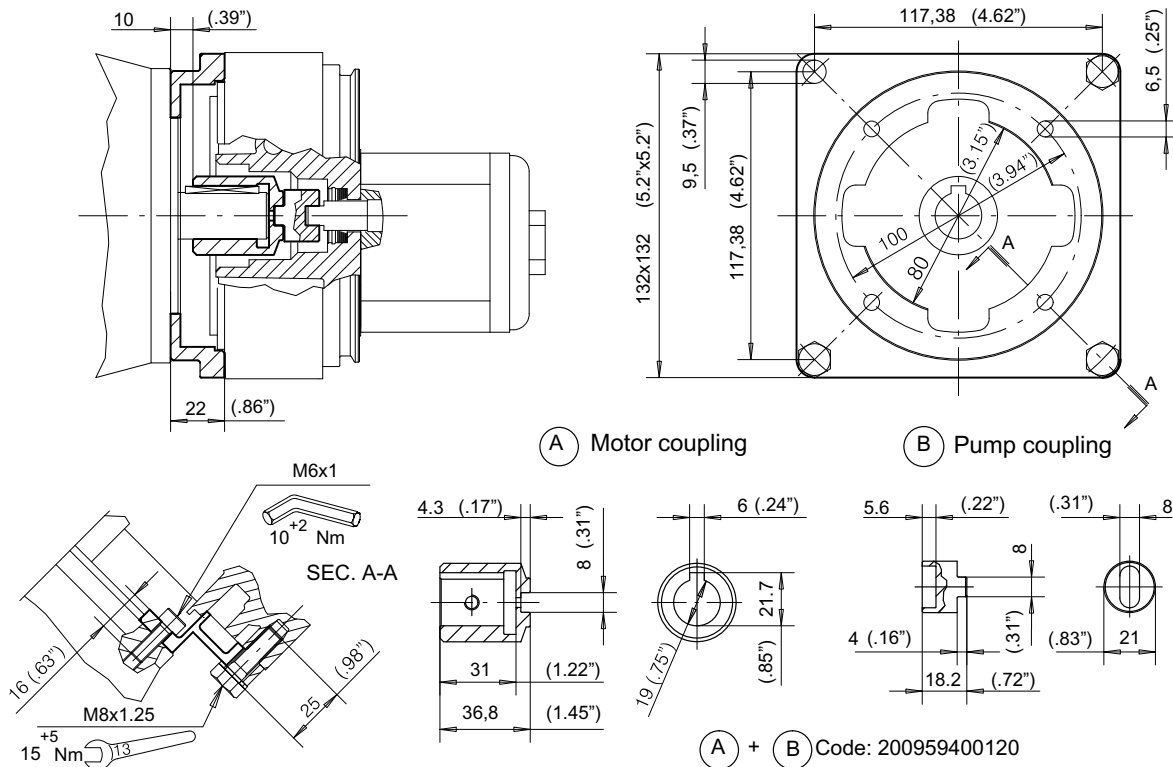


Coupling code
200659600290



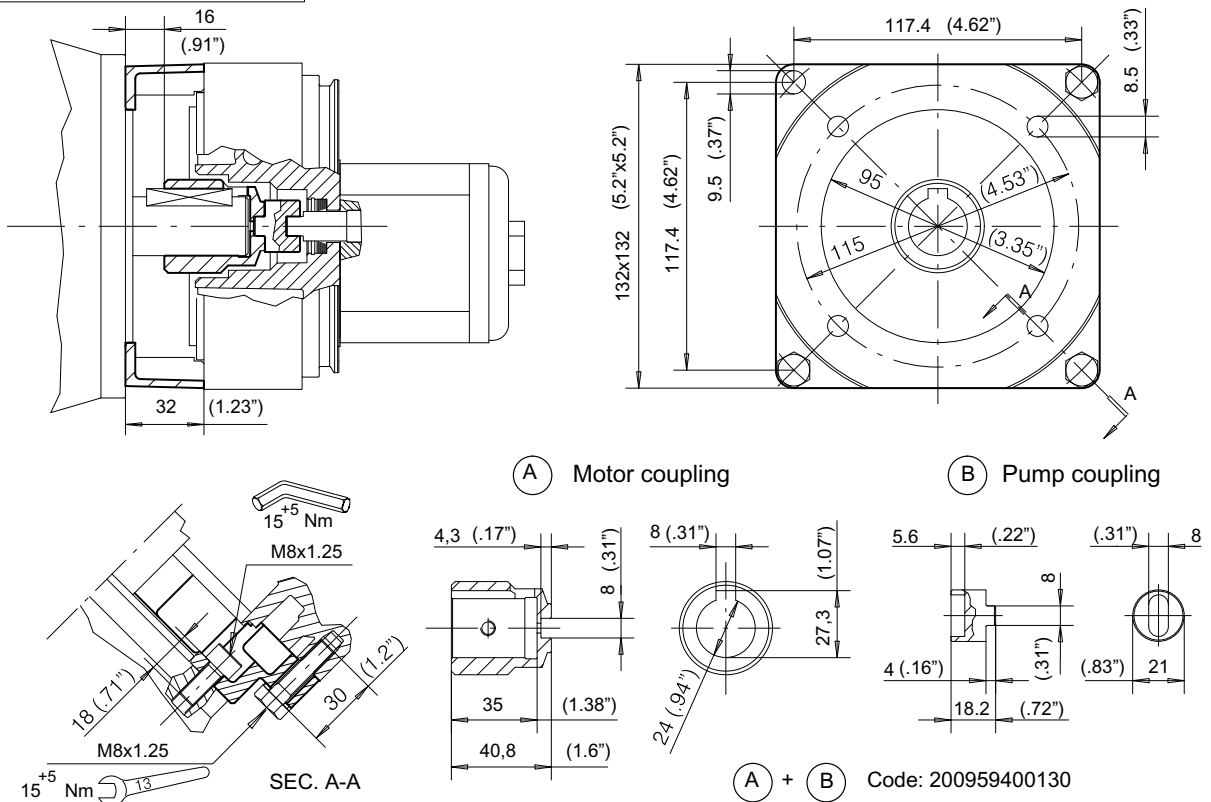
6.6 Drive E131

Code E131 200960400430



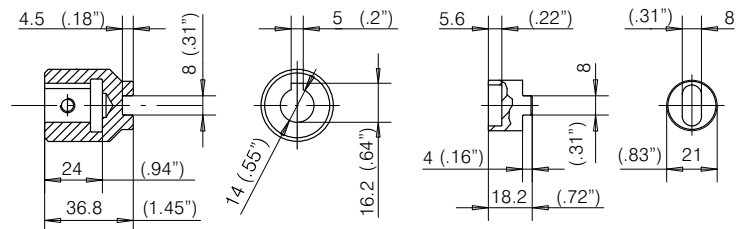
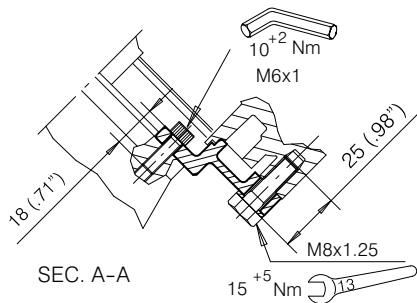
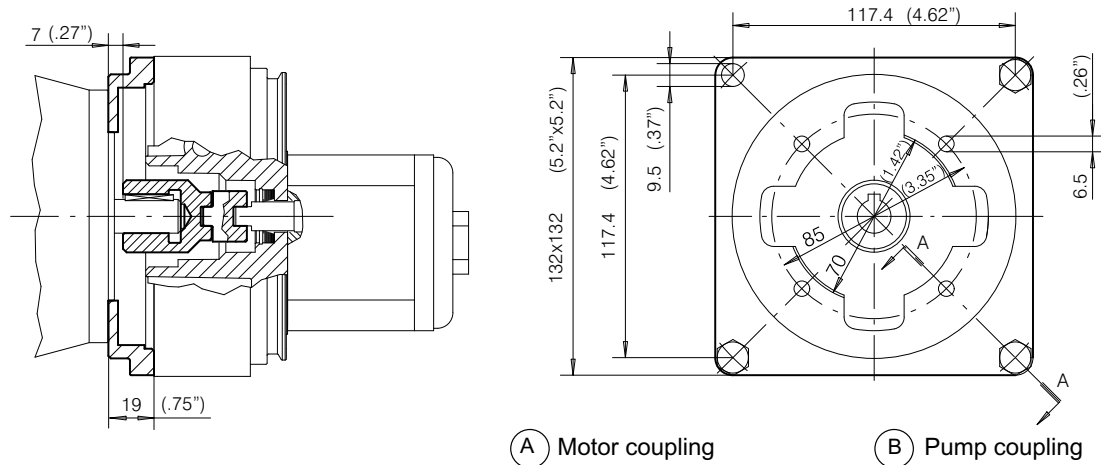
6.7 Drive E132

Code E132 200960400440



6.8 Drive E133

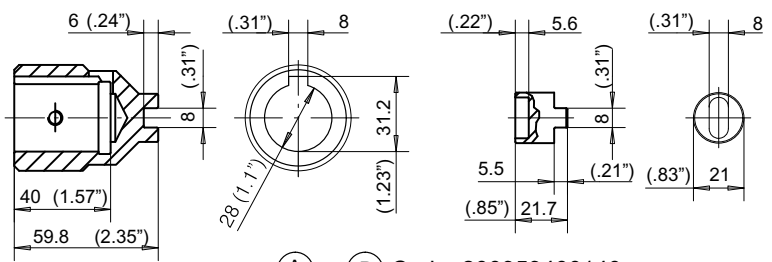
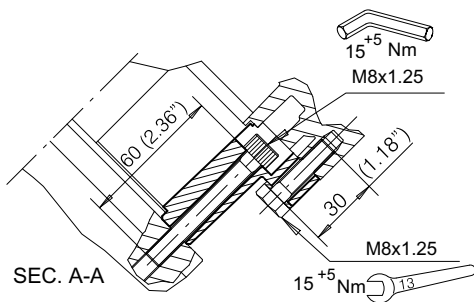
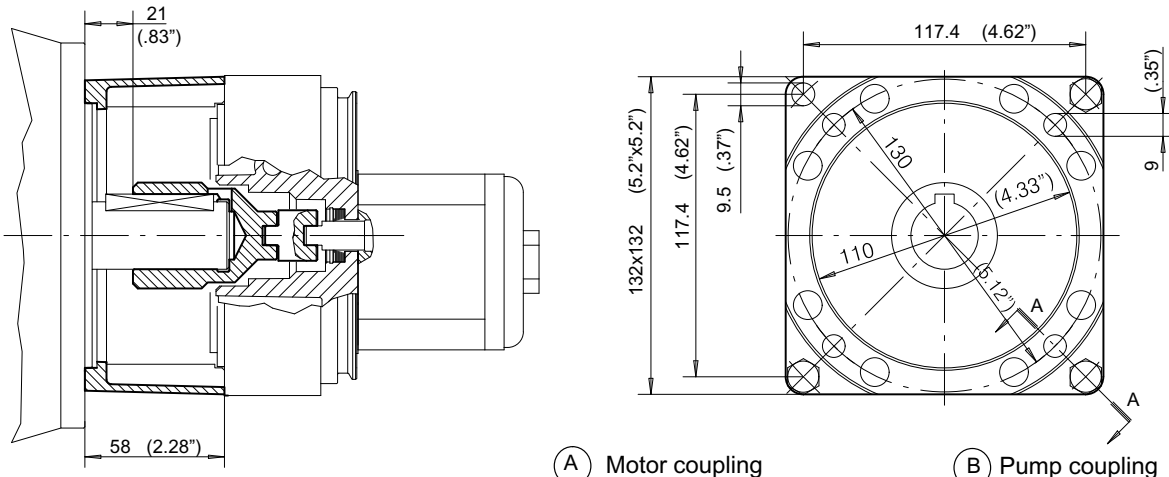
Code E133 200960400420



(A) + (B) Code: 200959400110

6.9 Drive E137

Code E137 200960400450



(A) + (B) Code: 200959400140

7 Cartridge valves

7.1 Introduction

This chapter includes all technical information relating to valves for use in conjunction with the housings described in section 1.

Complete the designation codes for the selected valves according to the technical information and guidelines given for

each component. Illustrated here by way of example is a correct and complete compilation for section 7 of the hydraulic power pack designation form.

7	Cavity a										Cavity b										Cavity c									
	1 5 V M 0 1 C										R S 3 / 8 1 7										S D F 8 1 7 / 2 2 - T H									
	N V 1 / 8 1 7 - R										V R C 8 1 8 / 1 1 - F																			
	Cavity g										Hand lever					Stick lever					Volt									
																					2 3									

7.1.1 Materials

Bucher Hydraulics cartridge valves are manufactured using steel of high mechanical strength. Friction and potential wear are minimized by special heat treatments. Surface heat treatments protect parts exposed to the external environment. Standard seals are NBR (Buna N), with backup ring in PTFE. For application requiring special compound FPM (Viton) etc. consult Bucher Hydraulics.

7.1.2 Indication for use

Use mineral oil based hydraulic fluids to ISO/DIN standard, only. Recommended viscosity range: 20-120 mm²/s (cSt) maximum viscosity 700 mm²/s (cSt).

For different fluids and operating conditions, consult our Sales Dpt.

All valves showed in the present catalogue are marked with correct flow direction, please observe it always. Valves must never be tampered with or modified.

Any unwarranted interference may adversely affect the safety and correct operation of the entire system.

Seals and backup rings are user-serviceable.

The appropriate replacement kit is indicated for each valve.

Before installing a valve in its cavity, ensure that the housing and all components of the system are clean.

Smear external seals lightly with grease, and check that any filters installed are correctly positioned.

Tighten the valve to the specified torque setting.

7.1.3 General technical information

All valves with leakage-free operating characteristic are 100% factory tested.

Nonetheless, the guaranteed maximum leakage may be exceeded if the valve is installed in a system with inadequate filtration.

Pressure drops and general performance indicated in the catalogue are referred exclusively to the component.

In the case of valves subject to adjustable setting, such as the pressure relief and if not specified in the order, we set them according to standard setting values indicated at section 7.2.1.

7.1.4 Solenoid valves

The correct selection of the solenoid valve is related to the maximum flow rate and operating pressure values. In a system with a single acting cylinder, therefore, it must be considered that the effective rate of flow through the unloading solenoid valve is not the flow delivered by the pump, but rather the momentary flow exhausted from the cylinder, or the restricted flow needing a pressure-compensated flow control valve, if installed.

The nominal voltage is the value indicated on the solenoid. Effective voltage must be measured at the terminals of the solenoid connector.

A maximum allowed tolerance of ±10% in relation to the nominal value is accepted.

Incorrectly power supply components and cables (which length has to be as shorter as possible) and/or low battery charge can cause not correct solenoid valve operation.

Standard solenoids valves are designed for D.C. operation. A.C. supply requires a connector with bridge rectifier included. When energized with A.C. voltage, the solenoids can operate at 50 or 60 Hz frequency, without distinction.

The connection used for standard solenoids are to EN 175301-803 (DIN 43650).

Solenoid with different connections (Amp JuniorTimer, Direct Wiring, etc.) can be supplied on request, after agreement with Bucher Hydraulics.

The solenoid can be rotated through 360°, and the connector positioned at 90° intervals.

Specified performance datas were recorded in stabilized solenoid operated temperature and voltage at the -10% of the nominal value.

All solenoid valves are fitted with protective O-rings installed between the tube and the solenoid.

This protects internal parts from condensation and contaminants, which could cause malfunction.

Standard solenoids are not suitable for operation in environments where there is any risk of explosion (see Directives and standards)

7.1.5 General notes on D.C. power input

A fast and secure coupling is obtained using the special connector (type 200544110009).

The cable coming from the D.C. power source (batteries, rectified a.c. main supply, etc.) must be connected as indicated in the diagram (figure 1).

The negative and positive polarity of the wires need not be verified for connection purposes. The connector incorporates a terminal for earthing the solenoid.

It is important to check that the grommet and armour clamp nut are correctly assembled (figure 2), as this prevents the cable being wrenched from connector.

7.1.6 General notes on A.C. power input

Solenoid valves can be operated off the A.C. mains supply using a special connector (type 200544110012) which con-

verts the current to provide the D.C. input required by the solenoid.

The connector in question is identified by a symbol (figure 3) marked both on the top and on the bottom face.

The conversion from alternate to direct current is effected by a rectifier circuit comprising a four-diode bridge, and a voltage-dependent resistor (figure 4) protecting against over voltages in the power supply circuit.

Accordingly, the solenoid are designed to operate correctly only when connected to a diode bridge which reduces the input voltage by 10%.

The earth connection is made by way of the terminal provided.

Fig. 1

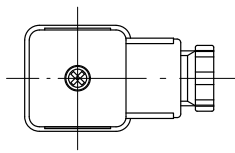
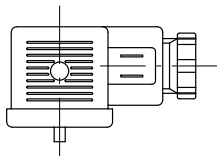
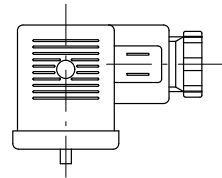


Fig. 2

Fig. 3



Rectifier symbol

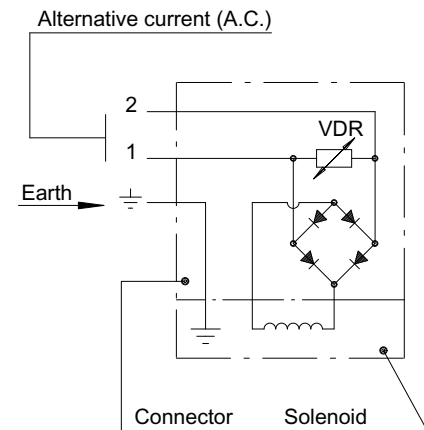
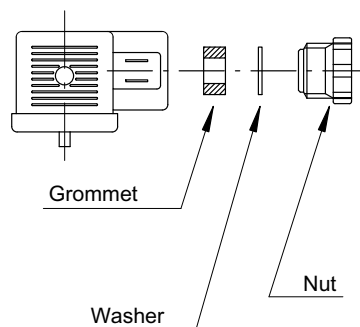
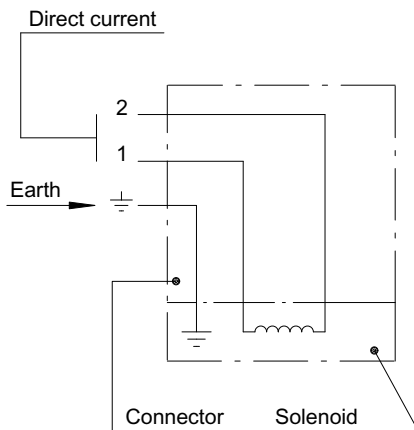
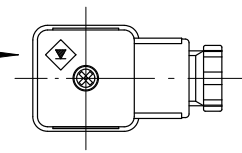


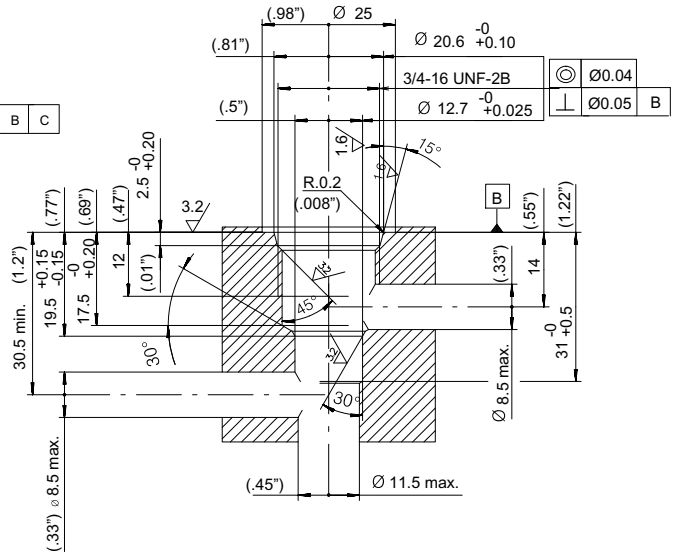
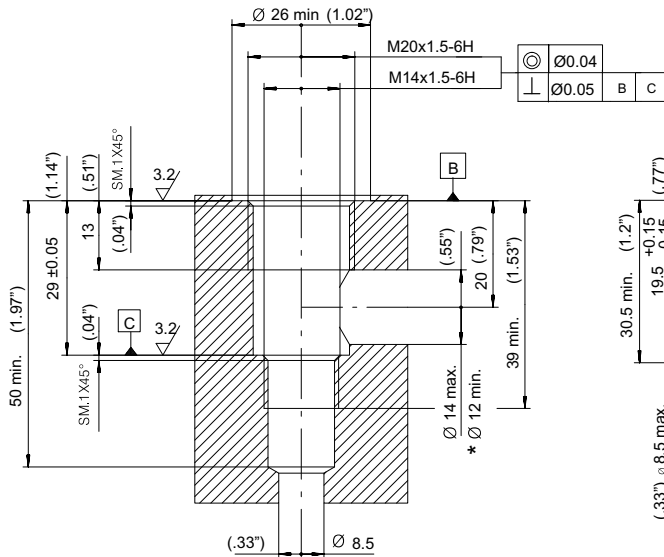
Fig. 4

For users wishing to make up special circuits and blocks with Bucher Hydraulics S.p.A. cartridge valves, it is important to observe the indications given below when machining the valve cavities.

For users wishing to make up special circuits and blocks with Bucher Hydraulics S.p.A. cartridge valves, it is important to observe the indications given below when machining the valve cavities.

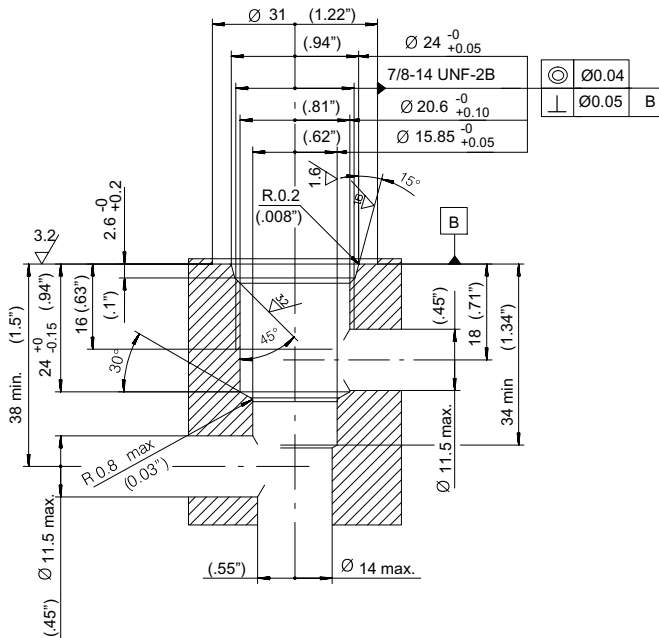
Two-way cavity M20x1.5

Two-way cavity 3/4" - 16 UNF



* If not possible to comply with the minimum diameter (12 mm), consider to increase the internal diameter (18,5 mm) with anular area near the discharging hole.

Two-way cavity 7/8" - 14 UNF

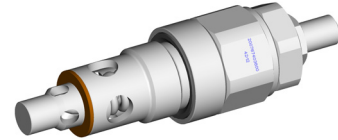
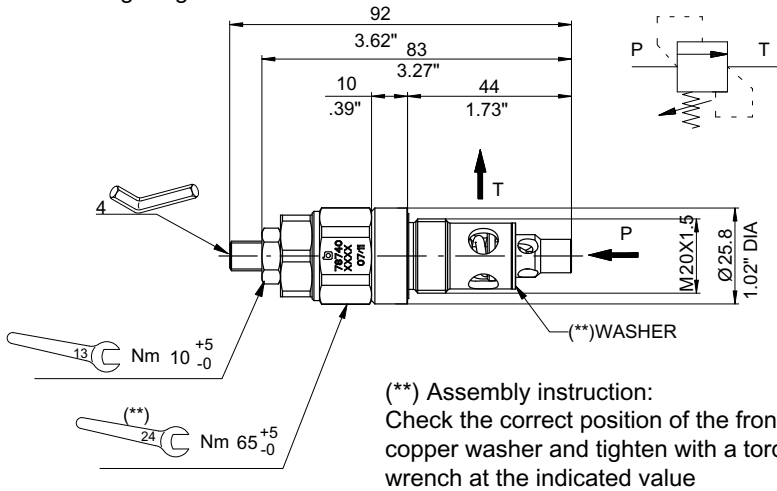


7.2 Pressure relief valves

7.2.1 Pressure relief valve: **VM01C

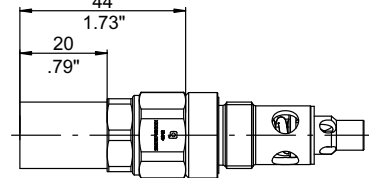
Direct acting
Balanced piston
Adjustable setting
Four setting ranges

Max. pressure 350 bar ***
Max. flow rate 60 l/min.
Temperature range -20/+100 °C
Weight 0.155 Kg.

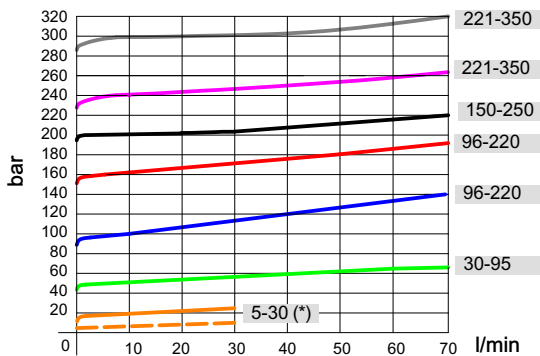


The valve can be sealed against tampering

Option: plastic tamper proof cap CAP01
code 200678400562



Pressure viscosity characteristic 46 cSt at 40°C



(*) see performances trace/minimum pressure setting (- - -)

The purpose of a relief valve is to keep the maximum system pressure at a safe level. When the hydraulic power unit is supplied with pressure relief valves, the correct calibration is provided by Bucher Hydraulics S.p.A. and there are no reasons to change this value.

*** Maximum admitted pressure value: 230 bar when used into power pack bodies.

Pressure setting

For present values other than those indicated, replace the first two digits of the designation with the setting required. For example, required setting 120 bar: designation type 12 VM01C. Always check that the required value falls within the standard ranges of adjustment.

Performances	
Max. flow	60 l/min.
Pressure setting flow	5 l/min
Max internal leakage	200 cm ³ /min at 80% of nominal pressure setting
Oil viscosity	12 to 400 cSt
Oil temperature	-20 to 100 °C
Recommended filtration	21/19/16 (10 NAS 1638)
Marking info:	Printed code and date

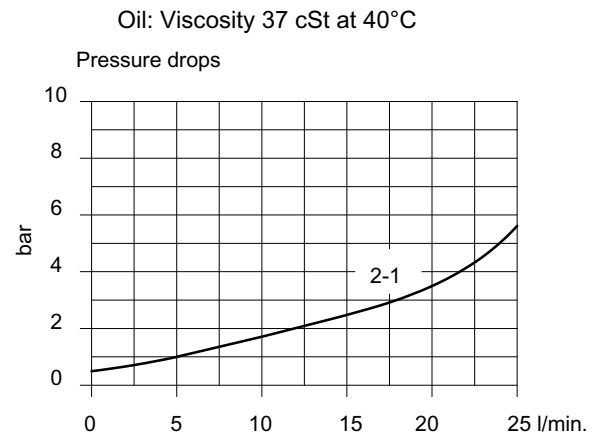
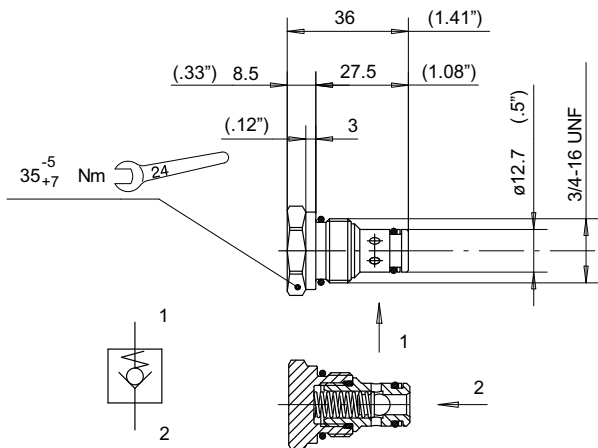
Spring	Setting range	Standard setting	Q max (l/min)	Type	Code
00	Plugged	Without valve	-	00VC00	200978400140
02	5 - 30 bar	20 bar	30 (*)	02VM01C	200787403600
05	30 - 95 bar	50 bar	60	05VM01C	200787403480
12	96 - 220 bar	120 bar	60	12VM01C	200787403420
15	150 - 250 bar	150 bar	60	15VM01C	200787403470
23	221 - 350 bar	230 bar	60	23VM01C	200787403430

7.3 Check valves

7.3.1 Check valve: RS3/817

Ball type
Flow from 2 to 1
Code 200787601410
Max. pressure 230 bar

Max. flow: 25 l/min.
Cracking pressure 0.5 bar
Temperature range -20/+90 °C
O-Ring replacement kit 200974200160
Weight 0.040 Kg

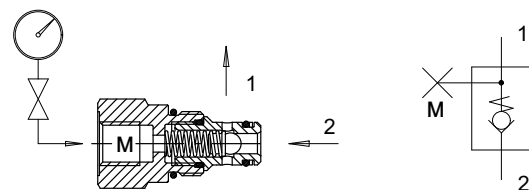
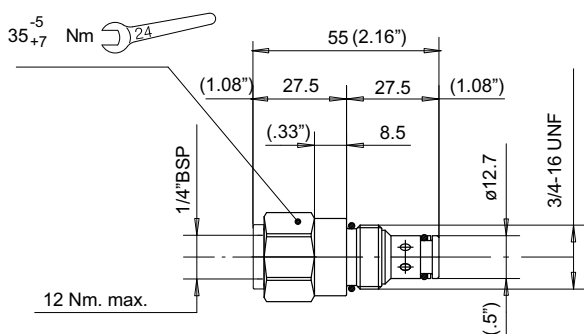


7.3.2 Check valve: RM3/817-A

Ball type
Flow from 2 to 1
Pressure through 1 and M

Max. pressure. 230 bar
Max. Flow: 25 l/min.
Cracking pressure 0.5 bar
Temperature range -20/+90 °C
O-Ring replacement kit 200974200160
Weight: 0.070 Kg

Code: 200787602160



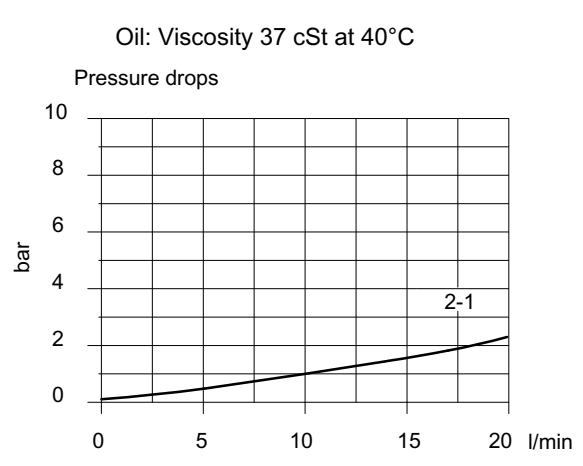
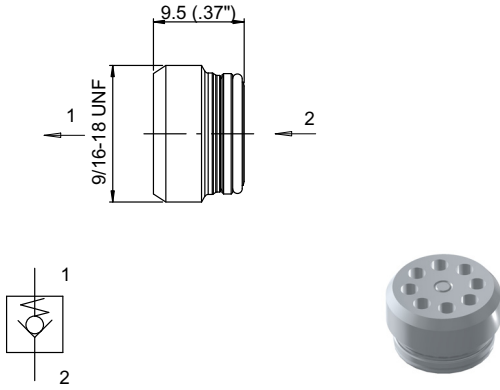
Port M must be used only as a pressure outlet.
Normally supplied plugged.

Apply the prescribed tightening torque at port **M**.
Pressure drops: see RS3/817 performances

7.3.3 Check valve: RP1/815-0.3 (for K7 only)

Ball type
 Flow from 2 to 1
 Code 200533940090
 Max. pressure (***) 350 bar

Install torque 6 Nm
 Max. flow: see diagram.
 Cracking pressure <0.5 bar
 Temperature range -20/+90 °C
 Weight 0.006 Kg



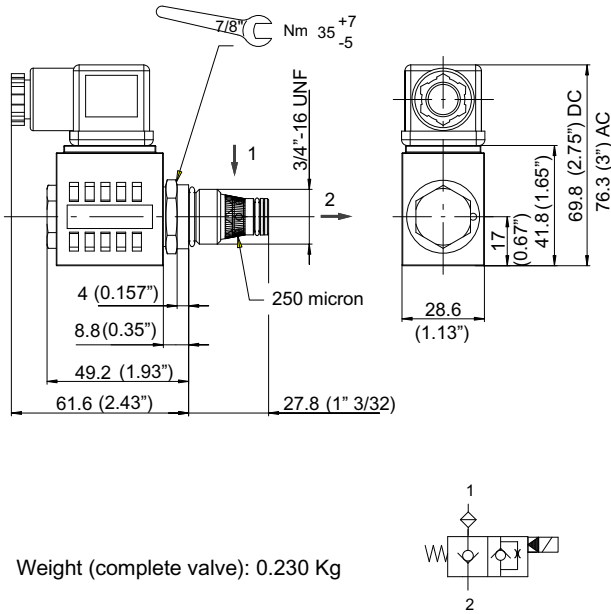
*** = max.admitted pressure when used into power pack bodies: 230 bar

7.4 Solenoid operated directional valves

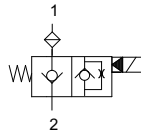
Circuit	Solenoid	Override	Type	Power	Description	Page	
Normally closed	On-Off	Without manual override			Standard version		
			Piloted	standard (16 Watt)	SPD817/22-TV	Page 98	
			Direct acting	heavy duty (27 Watt)	SDF817/22-TH	Page 99	
				With manual override			
		Piloted	standard (27 Watt)	SPFE817/22-TV	Page 100		
				Direct acting	heavy duty (27 Watt)	SDFE817/22-TH	Page 99
				Proportional			
				Without manual override			
				Piloted	standard (26 Watt)	PPF817/TV-03	Page 104
Normally open	On-Off	Without manual override			Standard version		
			Piloted	standard (27 Watt)	SPF817/22-TOV	Page 101	
				With manual override			
		Piloted	standard (27 Watt)	SPFE817/22-TOV	Page 101		

7.4.1 Solenoid operated directional valve: SPD817/22-TV

Normally closed
Piloted - 16 W
Poppet type
Flow from 1 to 2

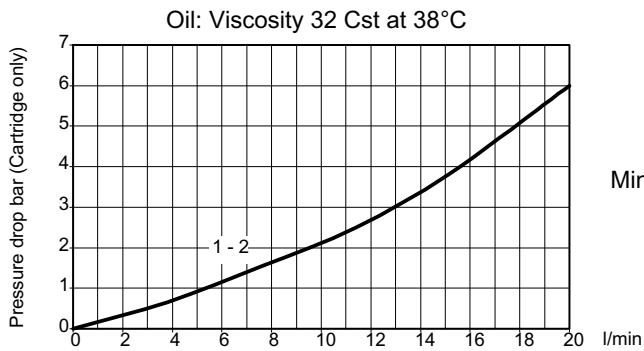


Weight (complete valve): 0.230 Kg



Performances	
Max. pressure (***)	270 bar
Max. recommended pressure	See 2.2
Max. flow	20 l/min.
Rated power	16 Watt
Intermittence	ED= 100%
Voltage tolerance	± 10%
Internal leakage	0-5 drops/min.
Temperature range	-20/+90 °C
Connector type	DIN 43650
Time to open 12 V 20 l/min 80% of final change of state	16 ms.
Time to close 12 V - 20 l/min 80% of final change of state	18 ms.
O-Ring replacement kit	200974200480

*** = max.admitted pressure when used into power pack bodies: 230 bar

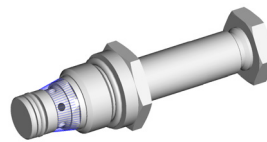


Minimum suggested working pressure = 5 bar

Directional valve without coil and connector

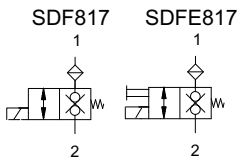
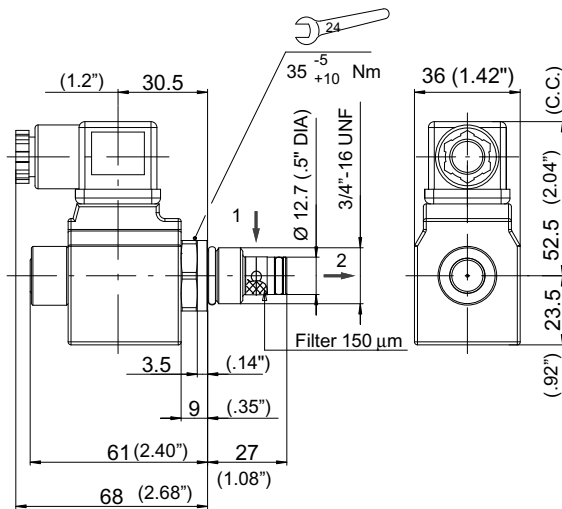
Type	Code*
SPD817/22-TV P.M.	200533910019

* Mechanical part code only. For connector and coil see section: 7.4.5 - 7.4.6



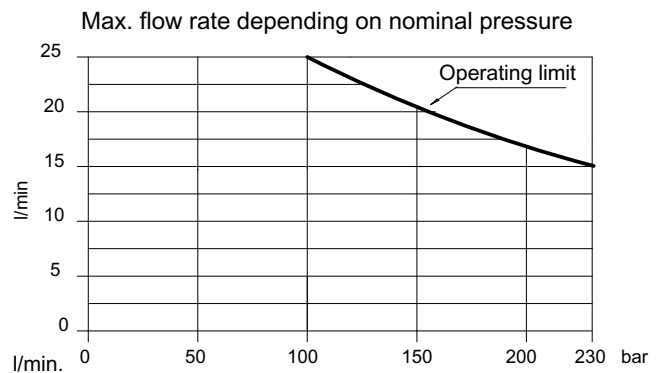
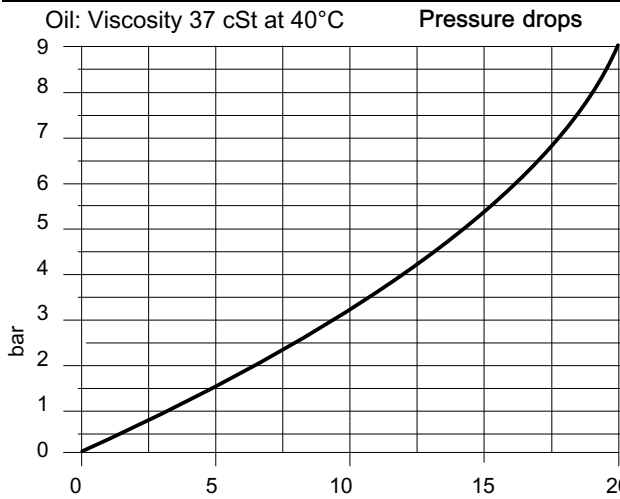
7.4.2 Solenoid operated directional valve: SDF817/22-TH - SDFE817/22-TH

Normally closed
Poppet type
Direct acting - 27 Watt
Flow from 1 to 2
With (SDFE) or without (SDF) manual override
Manual override = push to open



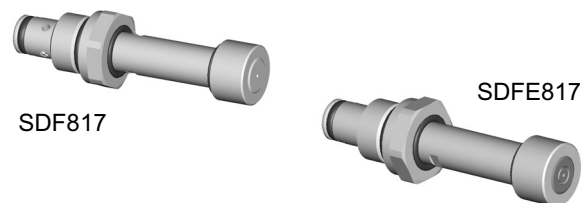
Weight (mechanical part only): 0.121 Kg

Performances	
Max. pressure	230 bar
Max. recommended pressure	See 2.2
Max. flow	15 l/min. 230 bar
Rated power	27 Watt
Intermittence	ED= 100%
Voltage tolerance	± 10%
Internal leakage	0-5 drops/min.
Temperature range	-20/+90 °C
Connector type	DIN 43650
Time to open (50-210 bar)	15-50 ms.
Time to close (50-210 bar)	10-50 ms.



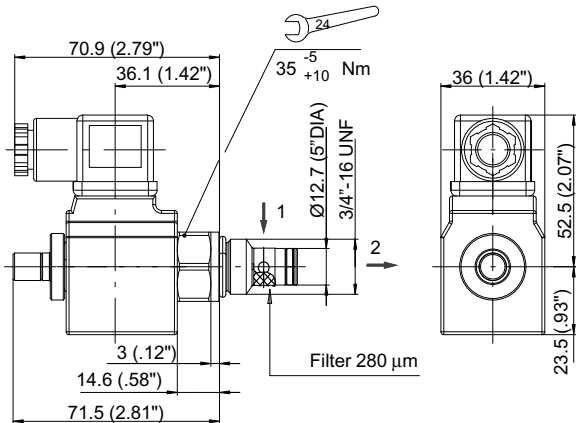
Type	Code*
ELVAL SDF817/22-TH P.M.	200757200940
ELVAL SDFE817/22-TH P.M.	200757200970

* Mechanical part code only. For connector and coil see section: 7.4.5 - 7.4.6



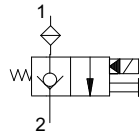
7.4.3 Solenoid operated directional valve: SPFE817/22-TV

Normally closed
Poppet type
Piloted (27 W)
Flow from 1 to 2
With manual override (screw type)
Manual override = unscrew to open



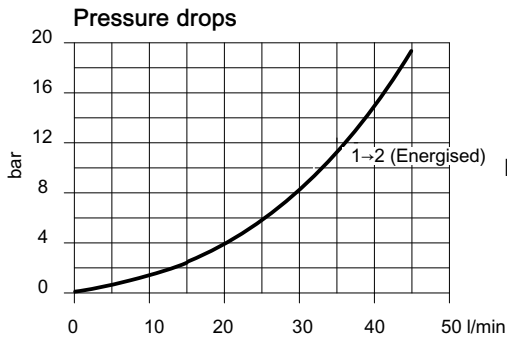
Performances	
Max. pressure (***)	350 bar
Max. recommended pressure	See 2.2
Max. flow	40 l/min.
Rated power	27 Watt
Intermittence	ED= 100%
Voltage tolerance	± 10% / -15%
Internal leakage	0.25 cm ³ /min.
Temperature range	-20/+90 °C
Connector type	DIN 43650
Time to open	<= 30 ms.
Time to close	<= 50 ms.

*** = max.admitted pressure when used into power pack bodies: 230 bar



Weight (mechanical part only): 0.118 Kg

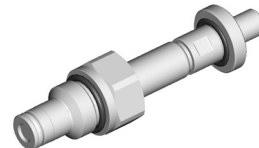
Oil: Viscosity 46 cSt at 40°C



Minimum suggested working pressure = 5 bar

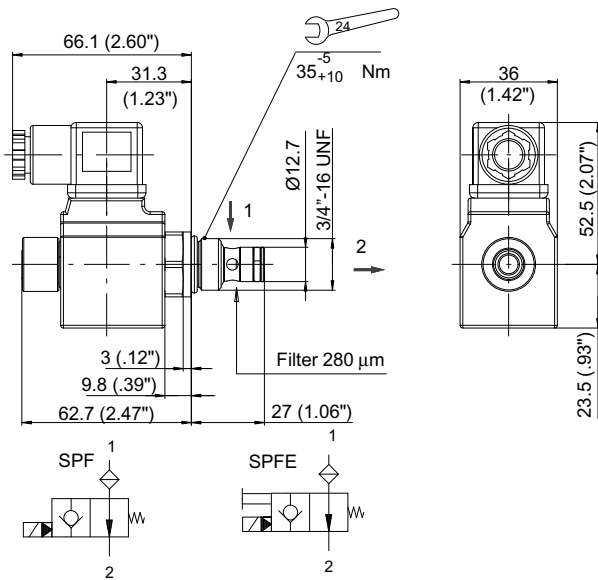
Type	Code*
ELVAL SPFE817/22-TV P.M.	200757200960

* Mechanical part code only. For connector and coil see section: 7.4.5 - 7.4.6



7.4.4 Solenoid operated directional valve: SPF817/22-TOV - SPFE817/22-TOV

Normally open
Poppet type
Piloted (27 W)
Flow from 1 to 2
With (SPFE) or without (SPF) manual override (pin type)
Manual override = push to open

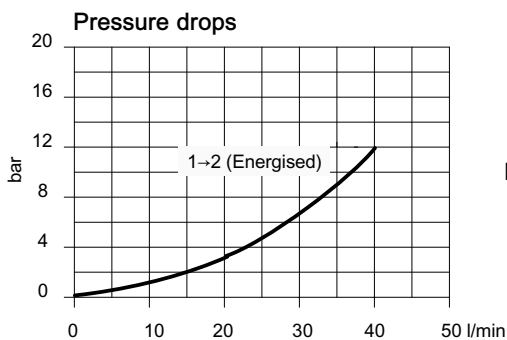


Weight (mechanical part only): 0.120 Kg

Performances	
Max. pressure (***)	300 bar
Max. recommended pressure	See 2.2
Max. flow	40 l/min.
Rated power	27 Watt
Intermittence	ED= 100%
Voltage tolerance	± 10% / -15%
Internal leakage	0.25 cm ³ /min.
Temperature range	-20/+90 °C
Connector type	DIN 43650
Time to open	<= 30 ms.
Time to close	<= 50 ms.

*** = max.admitted pressure when used into power pack bodies: 230 bar

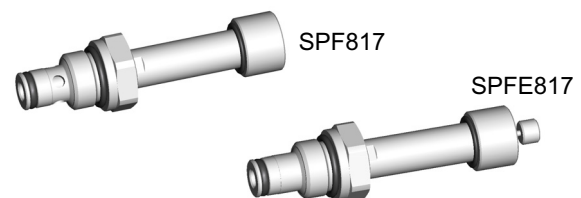
Oil: Viscosity 46 cSt at 40°C



Minimum suggested working pressure = 5 bar

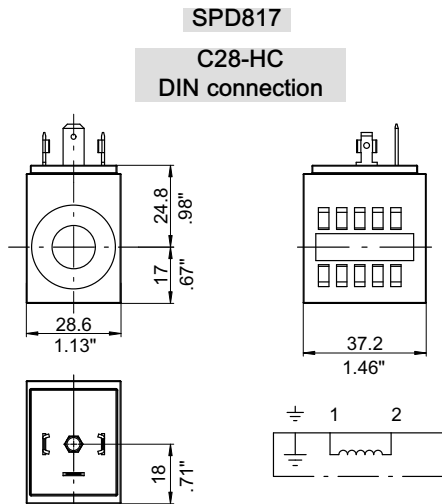
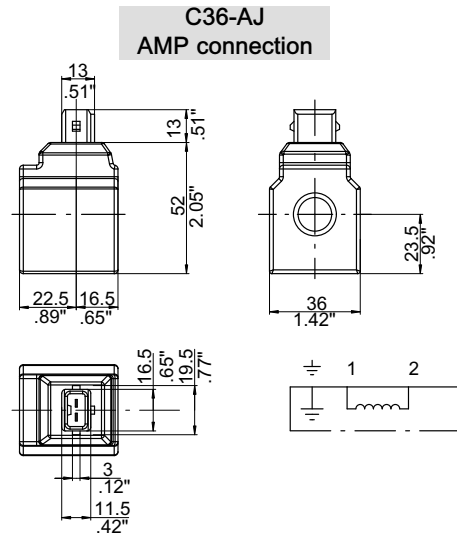
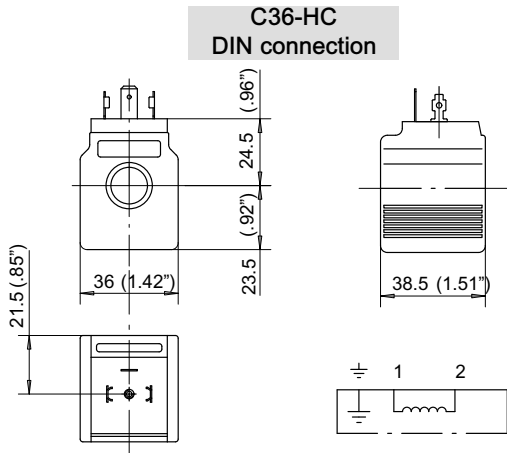
Type	Code*
ELVAL SPF817/22-TOV P.M.	200757200980
ELVAL SPFE817/22-TOV P.M.	200757200990

* Mechanical part code only. For connector and coil see section: 7.4.5 - 7.4.6



7.4.5 Directional valve solenoids

SDF817 - SPFE817 (TV-TO) - SDFE817 - SPF817 (TO)

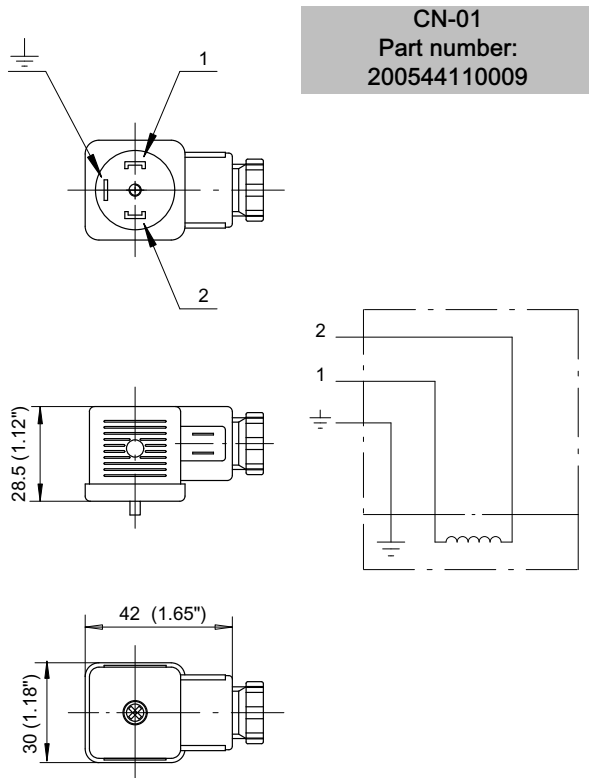


For solenoid valve series	C36-** SDF817 SPE817	C28-** SPD
Wire class	H (VDE0580)	
Protection	IP65 (DIN40050)	
Coil insulation	F	
Duty rating	ED 100%	
Connector style	DIN 43650 or AMP84-9419	DIN 43650
Stabilized temperature	70°C	95°C (DC vers.)
Voltage tolerance	± 10%	

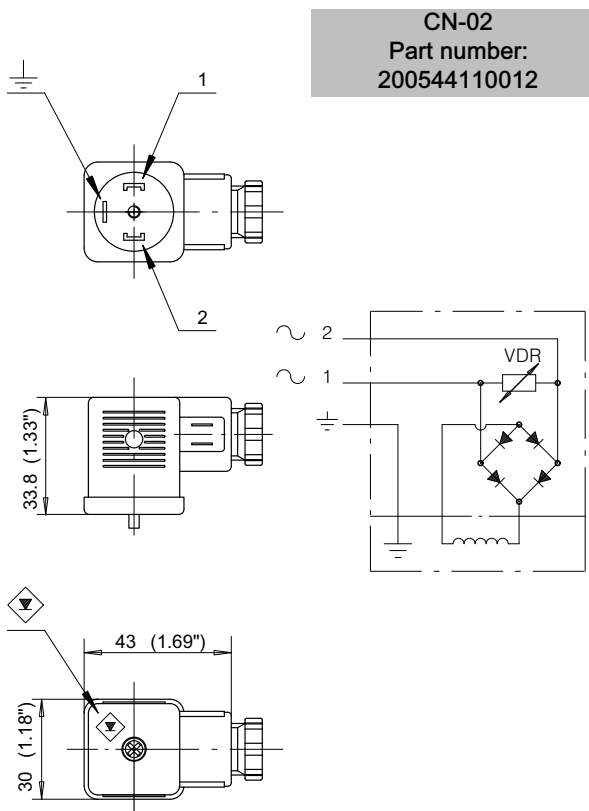
Connector style	Supply Voltage	Nominal Coil voltage	Power (Watt)	Resistance (Ohm)		Current (Ampere)		Coil code	Voltage code	
				Ambient temp.	Stabil. temp.	Ambient temp.	Stabil. temp.			
C36-** SDF - SPFE - SDFE - SPF	DIN	12 V. DC.	12 V. DC.	27.2	5.3	8	2.2	1.5	200674910100	13
		24 V. DC.	24 V. DC.	27	21.3	32	1.12	0.75	200674920080	23
		48 V. DC.	48 V. DC.	27	85.3	130	0.56	0.37	200674930030	33
		24 V. AC.	21.6 V. DC.	27.1	17.2	26	1.25	0.83	200674820050	21
		110 V. AC.	98 V. DC.	27	355	530	0.27	0.18	200674840050	41
		220 V. AC.	198 V. DC.	27.6	1422	2130	0.14	0.10	200674860060	51
	AMP	12 V. DC.	12 V. DC.	27.2	5.3	8	2.2	1.5	200674910250	13
		24 V. DC.	24 V. DC.	27	21.3	32	1.12	0.75	200674920200	23
C28-HC SPD	DIN	12 V. DC.	12 V. DC.	16	9	11.4	1.35	1.09	200541210039	13
		24 V. DC.	24 V. DC.	16	36	46.2	0.667	0.53	200541220037	23
		24 V. AC.	21.6 V. DC.	16	27.7	34.4	0.713	0.592	200541120015	21
		110 V. AC.	108 V. DC.	16	843	1053	0.15	0.1	200541140014	41
		220 V. AC.	216 V. DC.	16	3364	4168	0.624	0.498	200541160016	51

A.C. Supply requires a connector with bridge rectifier included.

7.4.6 Connector for solenoid directional valves



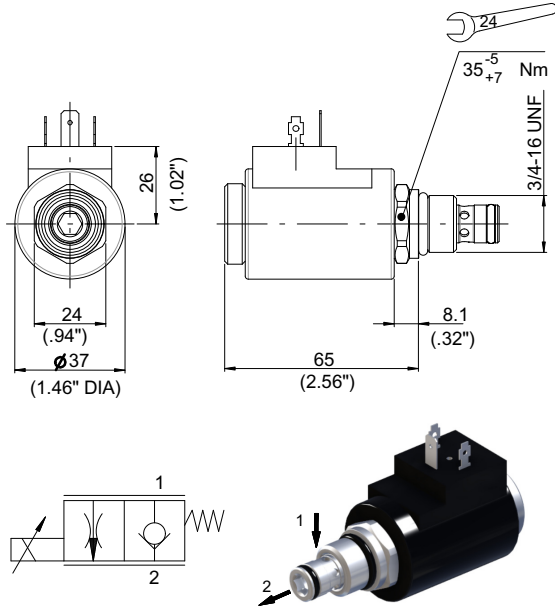
For power input	D.C.
Connector type	DIN 43650
Number of poles	2 + \perp
Supply voltage	max. 220 V.
Nom. capacity at contacts	10 A.
Max capacity at contacts	16 A.
Resistance at contacts	≥ 4 mOhm
Max section of cable	1.5 mm ²
Outer material	Glass fibre reinforced Nylon
Contact mount material	Nylon
Color	Black
Armour clamp	Pg 9
Ø cable	6-8 mm.
Protection factor	IP65 (DIN40050)
Insulation class	C (VDE0110)
Temperature range	-40 / +90 °C



For power input	A.C.
Connector type	DIN 43650
Number of poles	2 + \perp
Supply voltage	max. 220 V.
Nominal capacity at contacts	10 A.
Max. capacity at contacts	16 A.
Resistance at contacts	≥ 4 mOhm
Max. section of cable	1.5 mm ²
Outer material	Glass fibre reinforced Nylon
Contact mount material	Nylon
Color	Black
Diodes	1N 4007 GP
Overvoltage protection	VDR
Armour clamp	Pg 9
Ø cable	6-8 mm.
Protection factor	IP65 (DIN40050)
Insulation class	C (VDE0110)
Temperature range	-40 / +90 °C

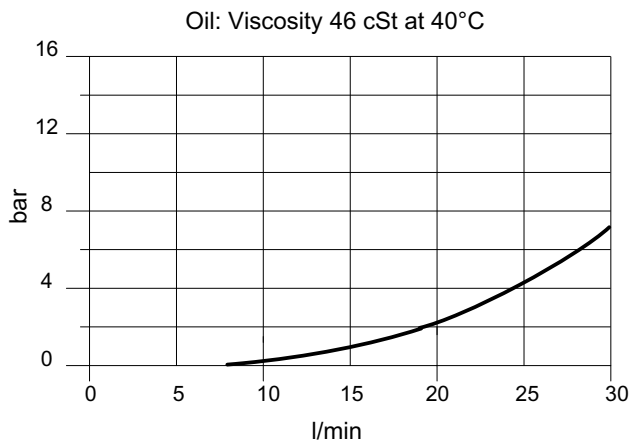
7.4.7 Proportional solenoid valve: PPF817/TV-03

Normally closed
Poppet type
Flow from 1 to 2

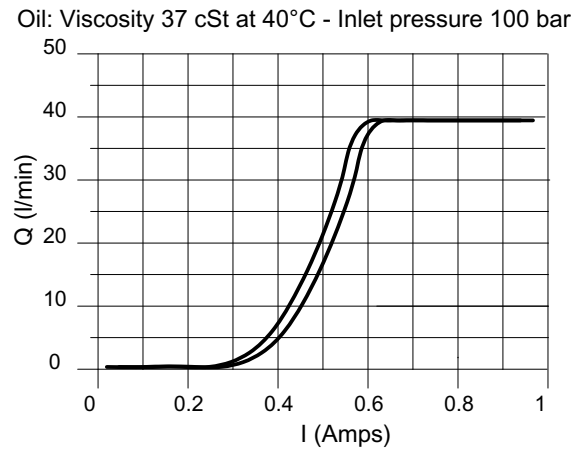


Electric performances 24 V	
Max. pressure	250 bar
Max. flow	30 l/min
Max internal leakage	5 drops/min
Voltage type	12 VDC
Voltage tolerance	+10% / -15%
Coil power	26 w
ED	100%
Fluids	Mineral based or synthetics with lubricating properties
Oil viscosity	7.4 to 420 cSt
Oil temperature range	-30° to 110°C
Recommended filtration	20/18/15 ISO 4406 (9NAS 1638)

Pressure drops



Typical hysteresis



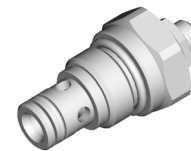
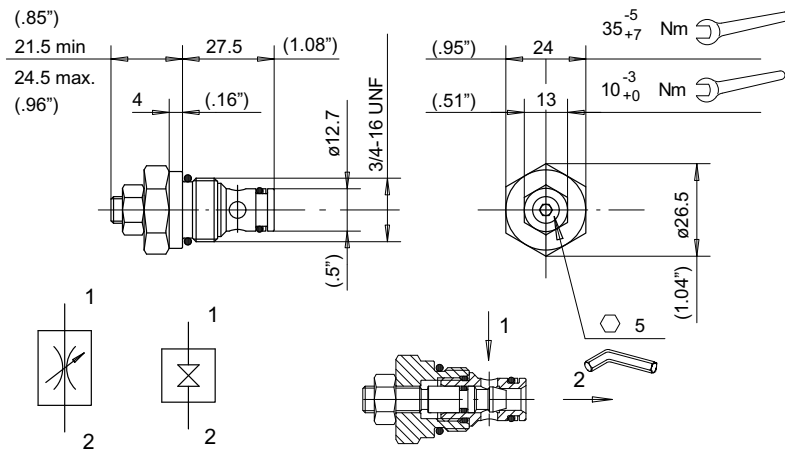
Type	Code*
ELVAL PPF817/TV-03 P.M.	200533960022
COIL 24 V. DC.	200674920020

7.5 Manual override valves

7.5.1 Manual override valve: NV1/817-R

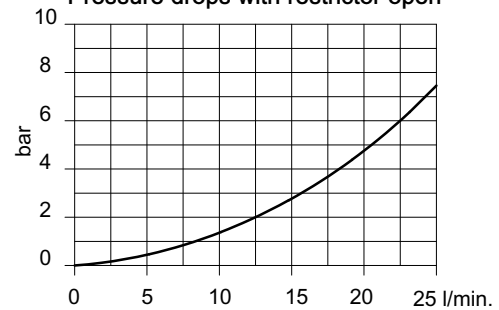
Manual override
 Flow restrictor
 Poppet type
 Flow from 1 to 2
 Code 200787601601

Max. pressure 230 bar
 Max. flow 25 l/min.
 Internal leakage 0-5 drops/min.
 Temperature range -20/+90 °C
 O-Ring replacement kit 200974200160
 Weight 0.110 Kg.



Oil: Viscosity 37 cSt at 40°C

Pressure drops with restrictor open

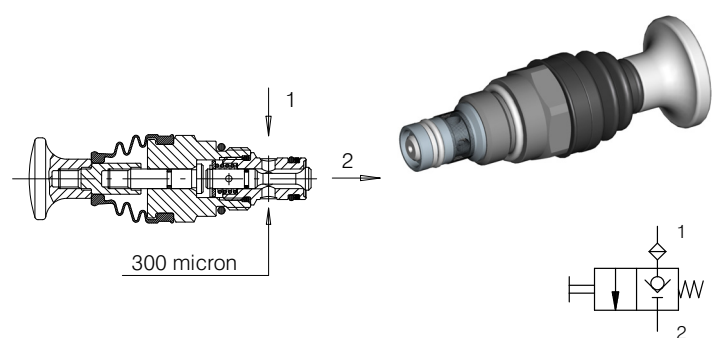
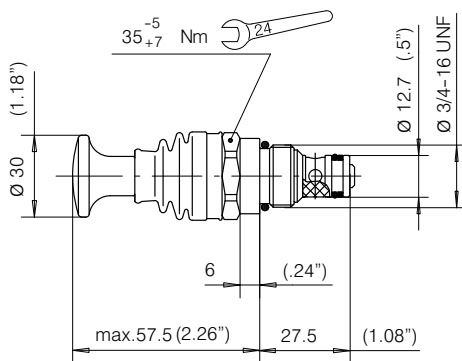


7.6 Directional valves

7.6.1 Directional valve: EPP817/22-TV

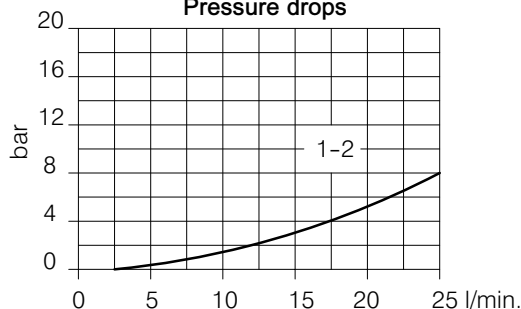
Manually operated
 Push to open
 Poppet type
 Flow from 1 to 2
 Max. pressure 230 bar

Max. Flow: 25 l/min.
 Internal leakage 0-5 drops/min.
 Temperature range -20/+90 °C
 O-Ring replacement kit 200974200160
 Weight: 0.140 Kg.



Oil: Viscosity 37 cSt at 40°C

Pressure drops



The **EPP817/...** comes complete with a knob allowing rapid operation, and a boot of plastic material to exclude dust, dirt, etc.

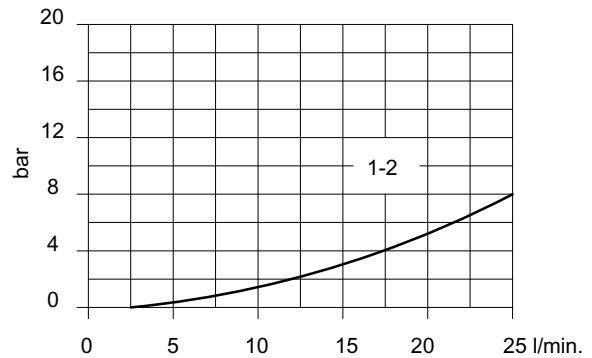
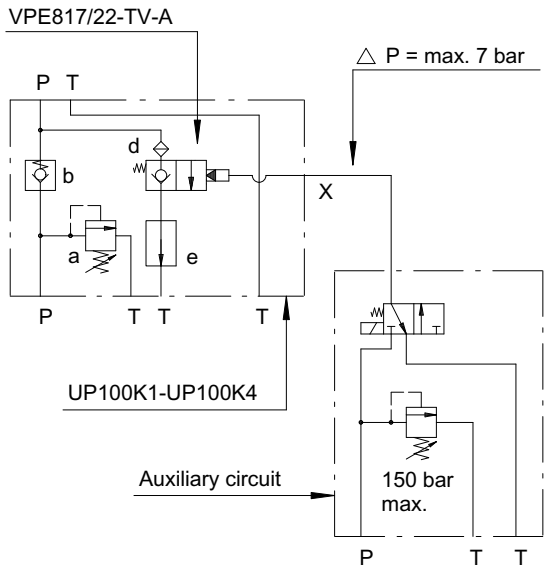
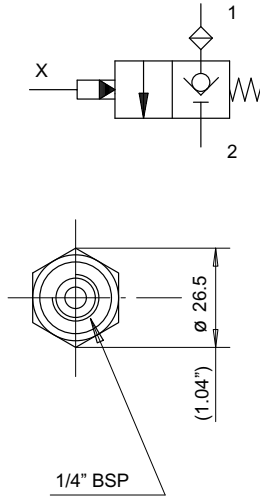
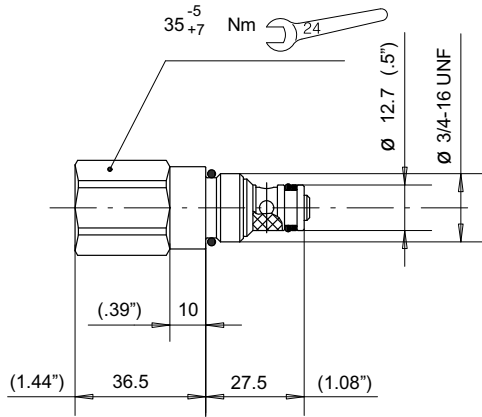
In this version, the knob is fitted with a stroke limiter to prevent possible damage to internal parts.

Type	Code
EPP817/22-TV	200787601680

7.6.2 Directional valve: VPE817/22-TV-A

Pilot operated
 External connection
 Poppet type
 Flow from 1 to 2
 Max. pressure 230 bar

Max. flow: 25 l/min.
 Internal leakage 0-5 drops/min.
 Temperature range -20/+90 °C
 O-Ring replacement kit 200974200160
 Weight: 0.130 Kg.



This is a pilot operated directional valve, two-way two-position series, with external pilot connection.

The connection of ports 1 and 2 across the valve is obtained by pressurizing the pilot chamber X from an external circuit. Pilot pressure difference to shift is 14 bar approx.

As illustrated in the hydraulic diagram alongside, the pilot chamber X must be connected to tank so as to ensure that the valve cannot be opened involuntarily by back pressure. Care must be taken that the pressure loss and maximum pressure values indicated in the diagram are not exceeded.

Pilot port	Type	Code
1/4" BSP	VPE817/22-TV-A	200787601740

7.7 Manual lowering valve

7.7.1 Manual lowering valve: ZR817/22-TV (dedicated housing is requested)

Normally closed

Code 200987601960

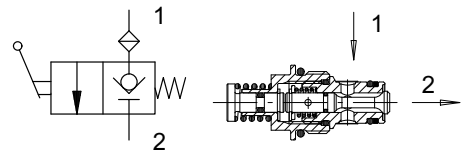
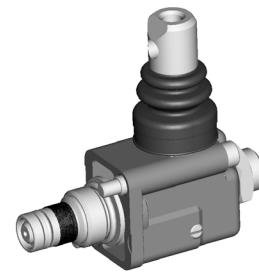
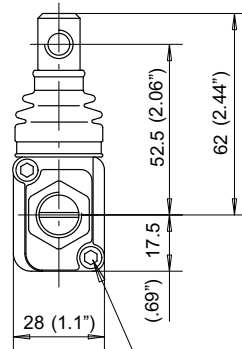
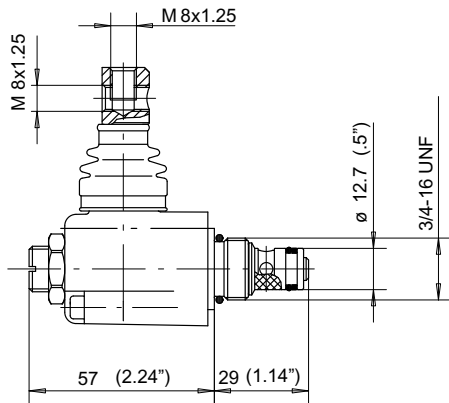
Max. pressure 230 bar

Max. flow 25 l/min.

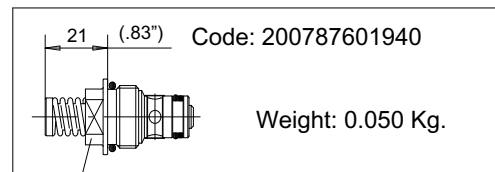
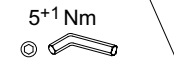
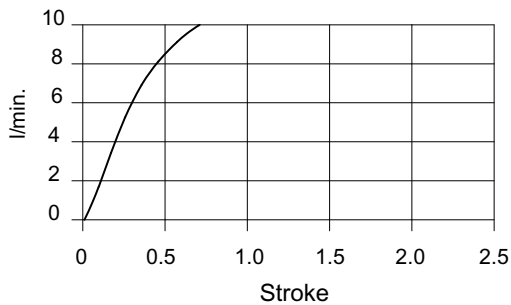
Internal leakage 0-5 drops/min.

Temperature range -20/+90 °C

O-Ring replacement kit 200974200160

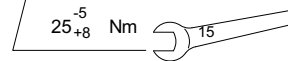


Metering performance.



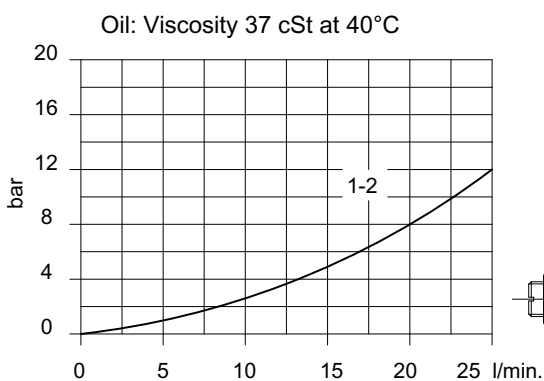
Code: 200787601940

Weight: 0.050 Kg.

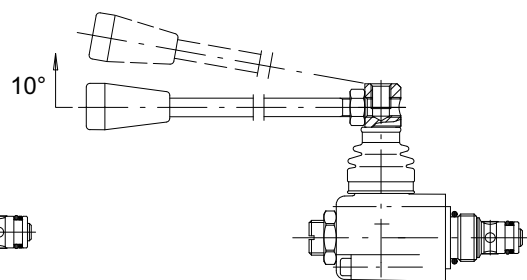
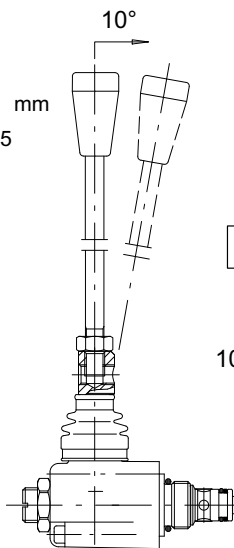


The connecting end of the lever allows the handle to be mounted in two different positions.

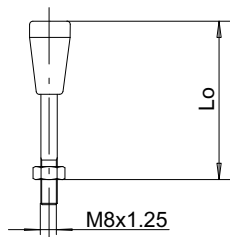
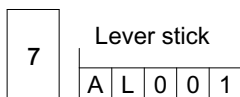
Mounting positions: L10-L12-L14-L16 (see 7.7.2)



Oil: Viscosity 37 cSt at 40°C



Lever stick



Lo Length	Type	Code
150 mm - 5.90 inches	AL001	200702210190
200 mm - 7.87 inches	AL002	200702210030
250 mm - 9.84 inches	AL003	200702210050
300 mm - 11.80 inches	AL004	200702210060

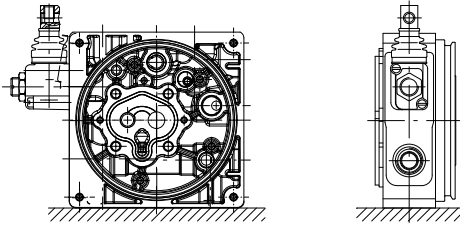
7.7.2 Manual lowering valve mounting positions

Mounting allowed in housing types K1-K4

Cavity **d**

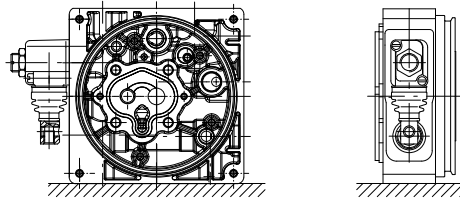
Type of housing										Vers.				
1	U	P	1	0	0	K	*	*	*	*	*	*		

Cavity d																			
7	Z	R	8	1	7	/	2	2	-	T	V								



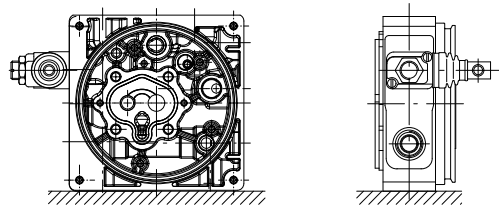
Hand lever
L 1 0

Lever stick
A L 0 0 *



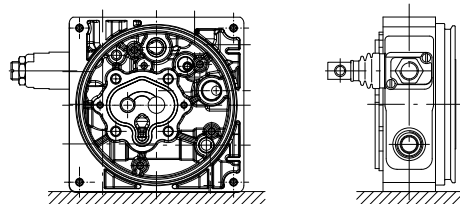
Hand Lever
L 1 2

Lever stick
A L 0 0 *



Hand lever
L 1 4

Lever stick
A L 0 0 *



Hand lever
L 1 6

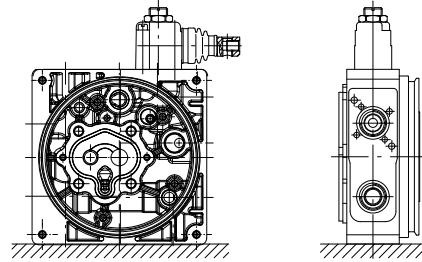
Lever stick
A L 0 0 *

Mounting allowed in housing type K1

Cavity **c**

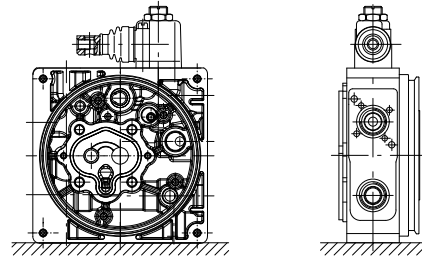
Type of housing										Vers.				
1	U	P	1	0	0	K	1	*	*	*	*	*		

Cavity c																			
7	Z	R	8	1	7	/	2	2	-	T	V								



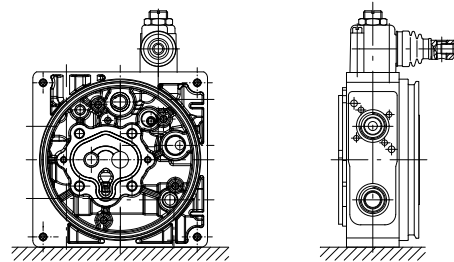
Hand lever
L 1 0

Lever stick
A L 0 0 *



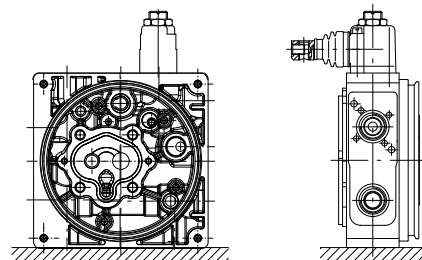
Hand lever
L 1 2

Lever stick
A L 0 0 *



Hand lever
L 1 4

Lever stick
A L 0 0 *



Hand lever
L 1 6

Lever stick
A L 0 0 *

7.7.3 Manual lowering valve with microswitch: ZR817/22-TVM (dedicated housing is requested)

Normally closed

Code 200987601950

Max. pressure 230 bar

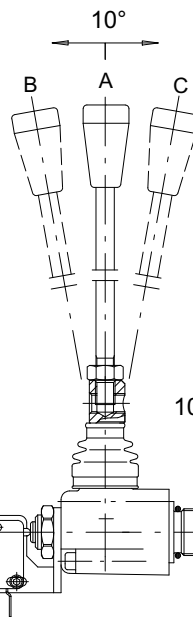
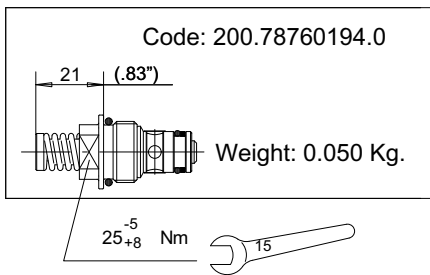
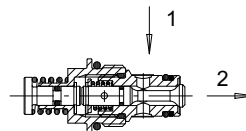
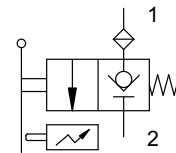
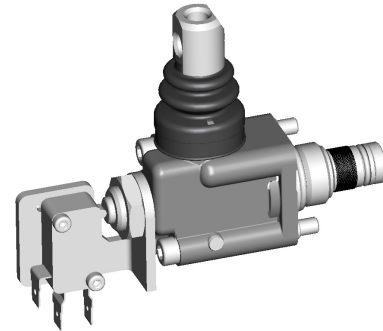
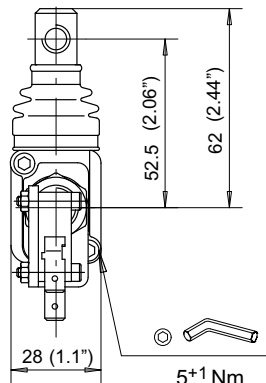
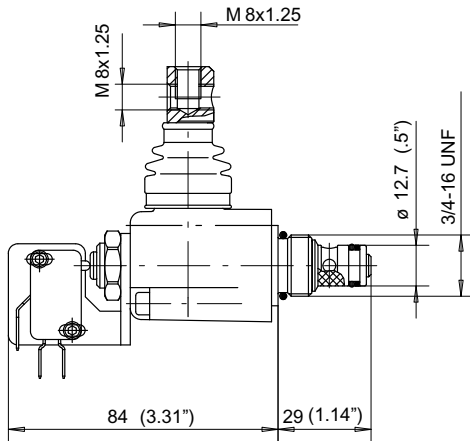
Max. flow 25 l/min.

Internal leakage 0-5 drops/min.

Temperature range -20/+90 °C

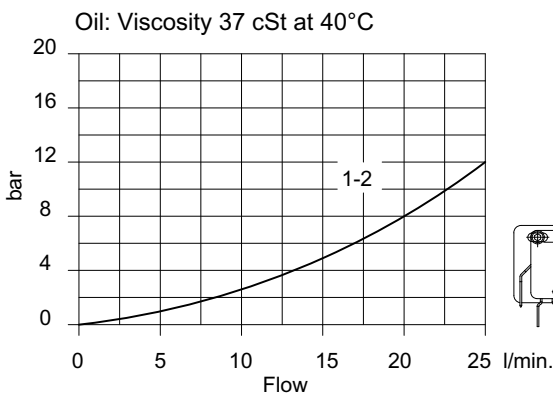
O-Ring replacement kit 200974200160

Microswitch performance: see section 9.3



A → B = Microswitch operated
A → C = Hydraulically operated

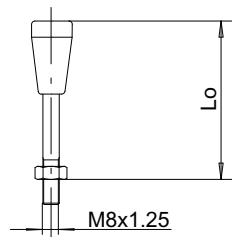
The connecting end of the lever allows the handle to be mounted in two different positions.



Mounting positions: L10-L12-L14-L16 (see 7.7.2)

Lever stick

7	Lever stick				
	A	L	0	0	1



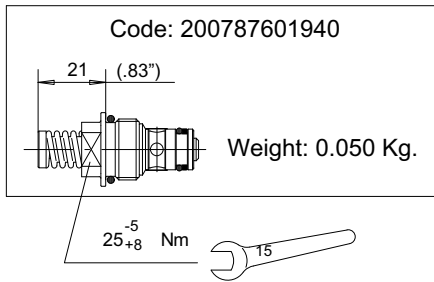
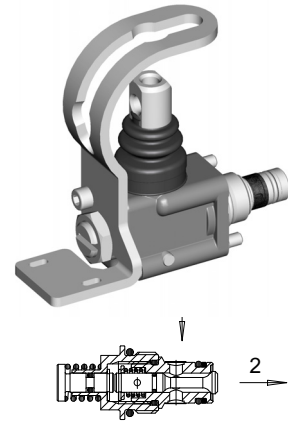
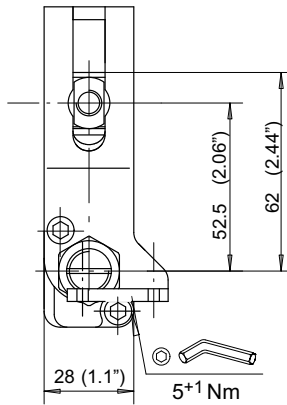
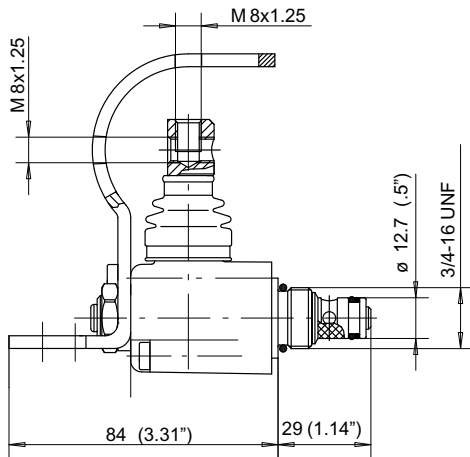
Lo Length	Type	Code
150 mm - 5.90 inches	AL001	200702210190
200 mm - 7.87 inches	AL002	200702210030
250 mm - 9.84 inches	AL003	200702210050
300 mm - 11.80 inches	AL004	200702210060

7.7.4 Manual lowering valve with safety lever support and without microswitch: ZR817/22-TVS

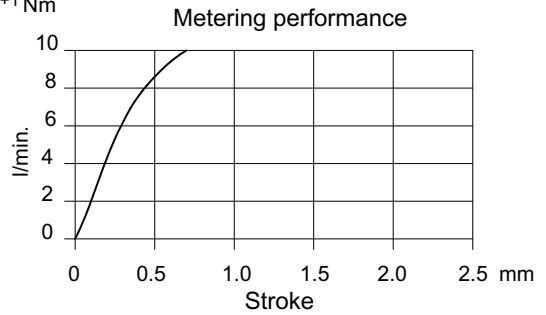
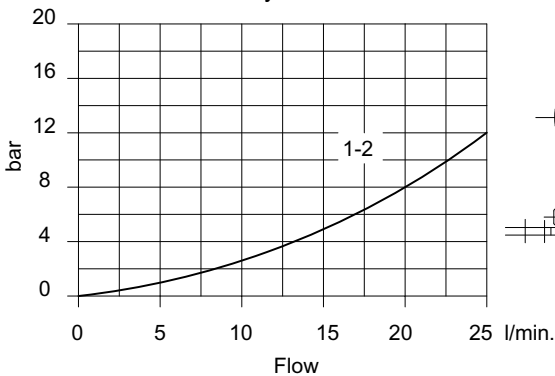
For housings:
UP100/K1
UP100/K4
Normally closed

Max. pressure 230 bar
Max. flow: 25 l/min.
Internal Leakage 0-5 drops/min.
Temperature range -20/+90 °C
O-Ring replacement kit 200974200160

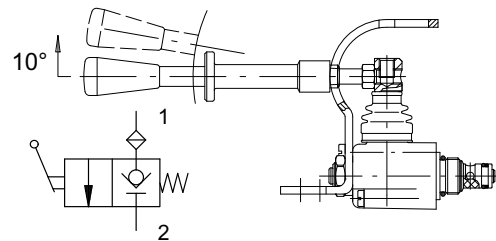
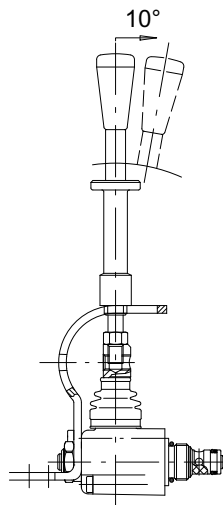
Code 200987601970



Oil: Viscosity 37cSt at 40°C

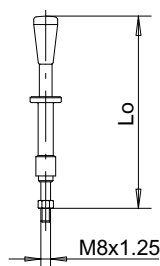
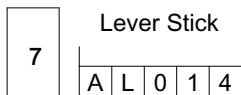


The connecting end of the lever allows the handle to be mounted in two different positions.



Mounting positions: L10-L14-L16 (see 7.7.2)

Lever Stick



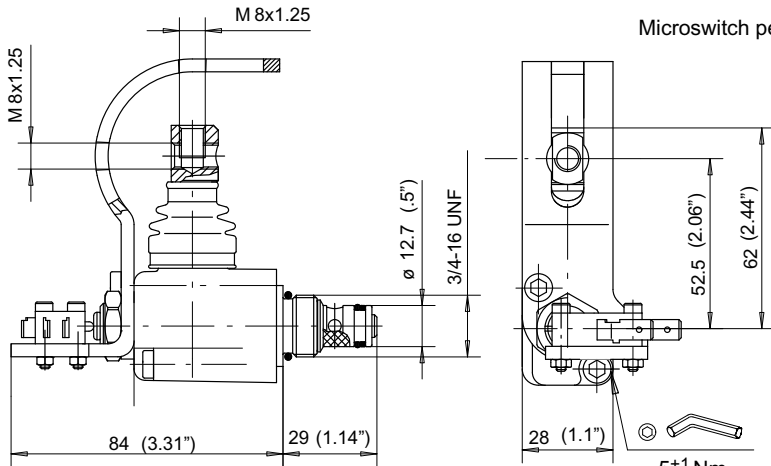
L ₀ Length	Type	Code
160 mm-6.29 inches	AL014-E	200702210090
122 mm-4.82 inches	AL002-E	200702210040

7.7.5 Manual lowering valve with microswitch and safety lever support: ZR817/22-TVMS

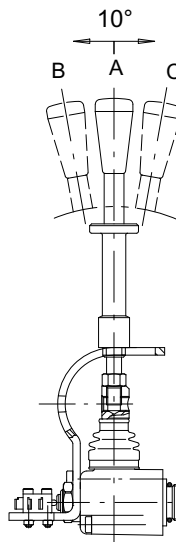
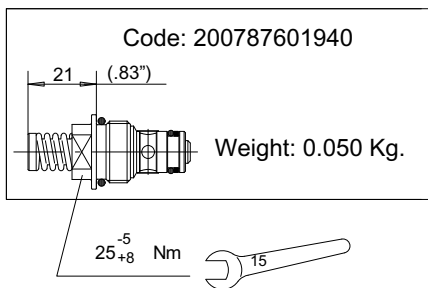
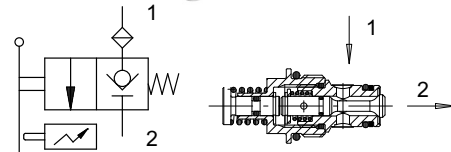
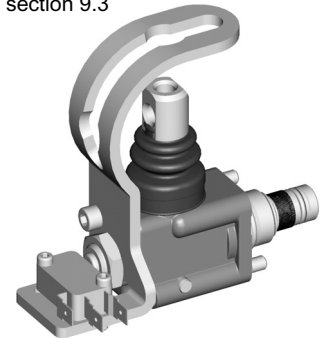
For housings:
 UP100/K1
 UP100/K4
 Normally closed

Max. pressure 230 bar
 Max. flow 25 l/min.
 Internal leakage 0-5 drops/min.
 Temperature range -20/+90 °C
 O-Ring replacement kit 200974200160

Code 200987601980



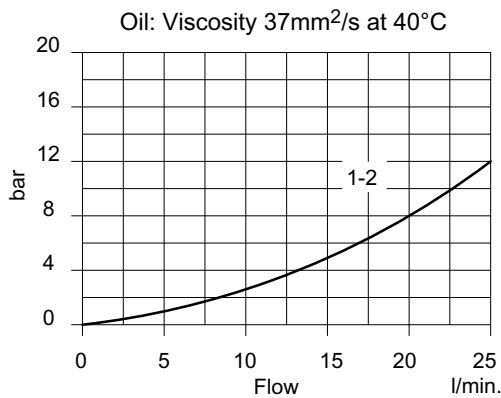
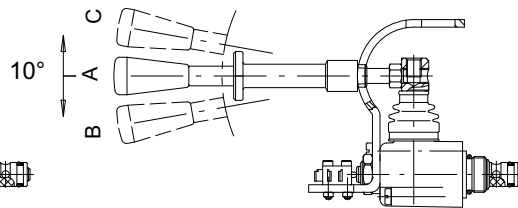
Microswitch performance: see section 9.3



A → B = Microswitch operated

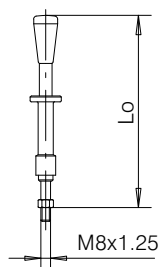
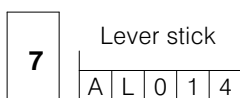
A → C = Hydraulically operated

The connecting end of the lever allows the handle to be mounted in two different positions.



Mounting positions: L10-L14-L16 (see 7.7.2)

Lever Stick

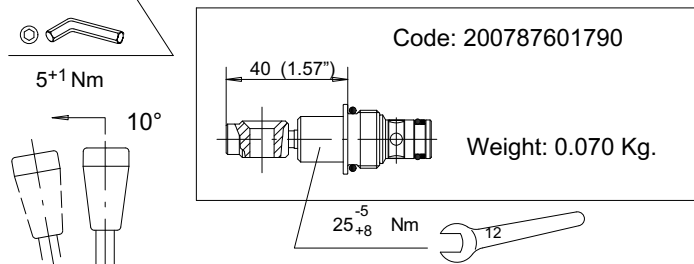
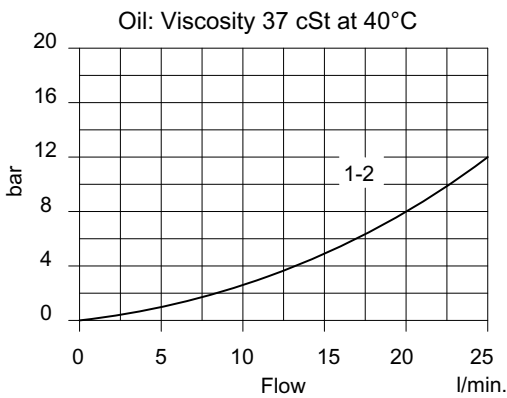
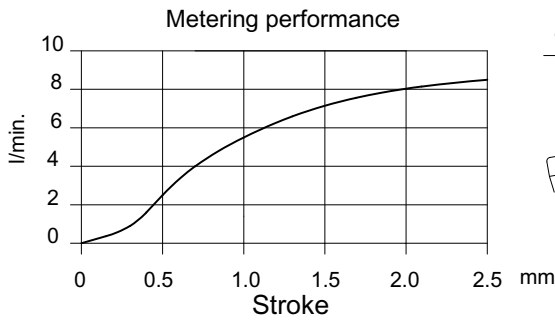
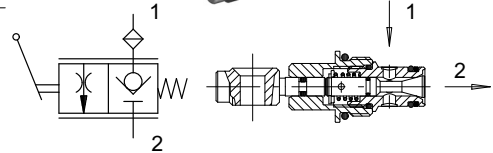
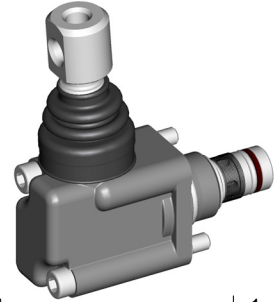
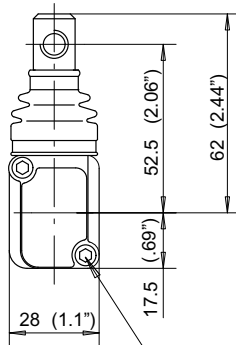
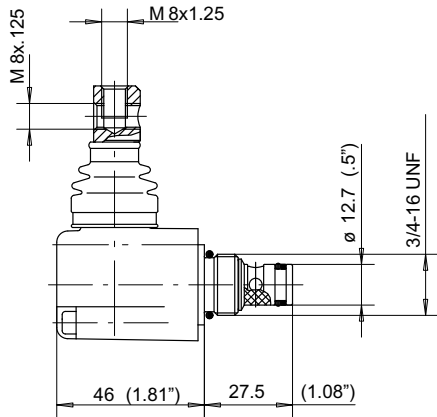


L ₀ Length	Type	Code
160 mm-6.29 inches	AL014-E	200702210090
122 mm-4.82 inches	AL002-E	200702210040

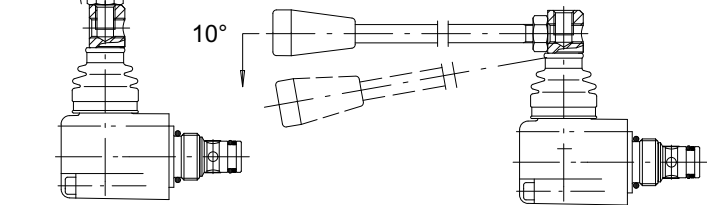
7.7.6 Manual lowering valve: Z817/22-HS

For housings:
 UP100/K1
 UP100/K4
 Normally closed
 High sensibility
 Code 200987601800

Max. pressure 230 bar
 Max. flow: 25 l/min.
 Internal Leakage 0-5 drops/min.
 Temperature range -20/+90 °C
 O-Ring replacement 200974200160

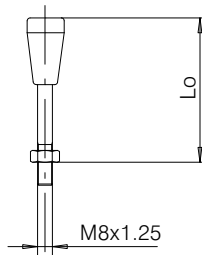
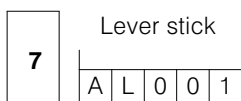


The connecting end of the lever allows the handle to be mounted in two different positions.



Mounting positions: L10-L12-L14-L16 (see 7.7.2)

Lever stick



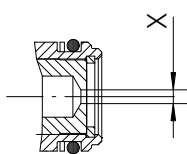
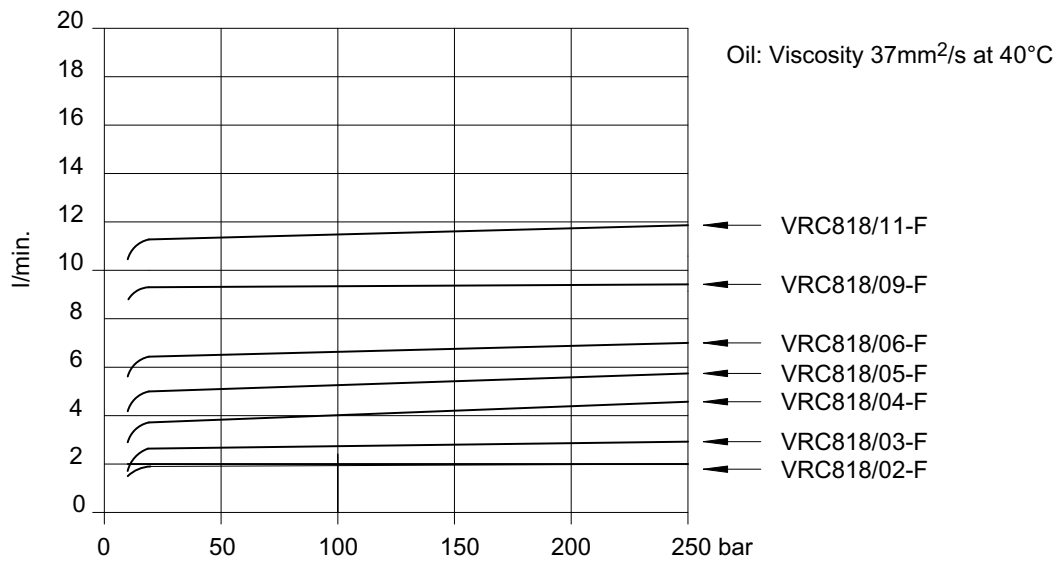
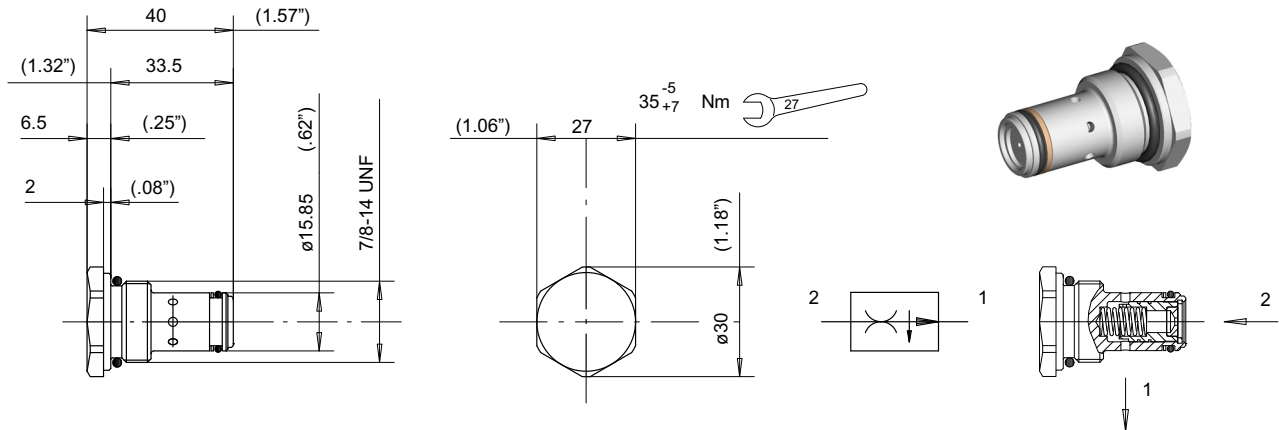
L ₀ Length	Type	Code
150 mm-5.90 inches	AL001	200702210190
200 mm-7.87 inches	AL002	200702210030
250 mm-9.84 inches	AL003	200702210050
300 mm-11.80 inches	AL004	200702210060

7.8 Flow control valves

7.8.1 Flow control valve: VRC818/**-F

Compensated
Fixed setting
Seven pre-set flow values
Flow from 2 to 1

Max. pressure 230 bar
Max. flow: 30 l/min.
Controlled flow rate see table
Tolerance $\pm 15\%$
Temperature range $-20/+90\text{ }^{\circ}\text{C}$
O-Ring replacement kit 200974200150
Weight: 0.090 Kg.

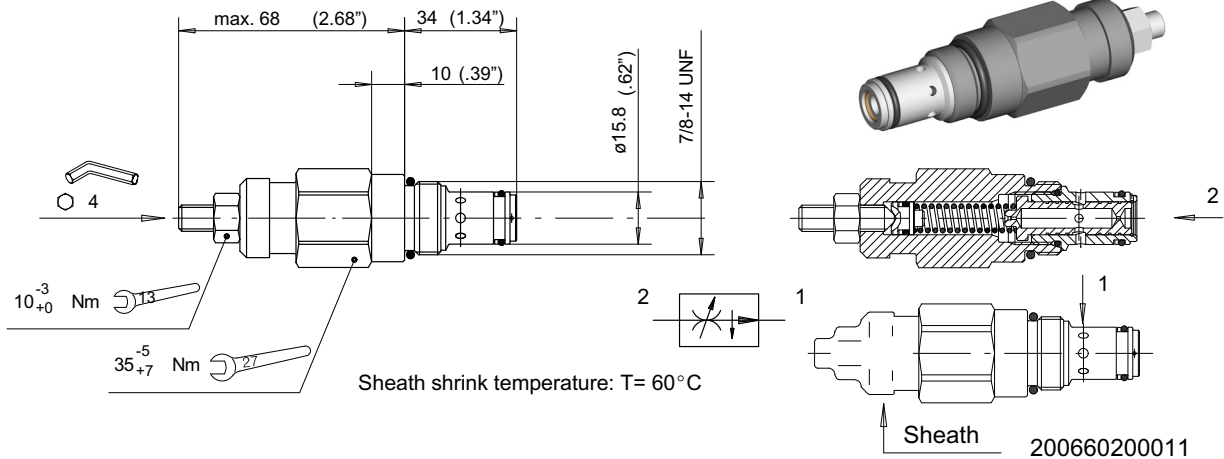


Nominal flow	Ø X	Type	Code
2 l/min.	1.25	VRC818/02-F	200787200790
3 l/min.	1.50	VRC818/03-F	200787200780
4 l/min.	2.00	VRC818/04-F	200787200770
5 l/min.	2.25	VRC818/05-F	200787200760
6 l/min.	2.50	VRC818/06-F	200787200750
9 l/min.	3.00	VRC818/09-F	200787200740
11 l/min.	3.50	VRC818/11-F	200787200730

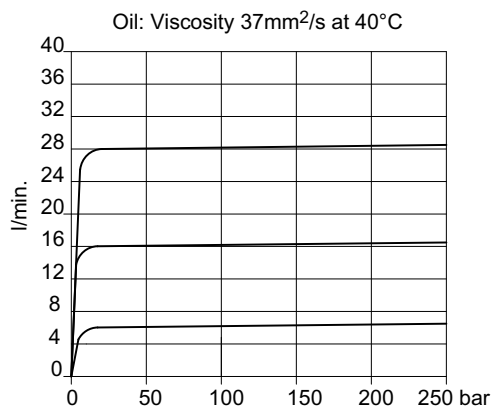
7.8.2 Flow control valve: VRC818/*-R

Compensated
Adjustable setting
Two setting flow ranges
Flow from 2 to 1
Max. pressure (***) 250 bar
Max. flow: 50 l/min.

Controlled: 1-6 l/min.
..... 5-30 l/min.
Temperature range -20/+90 °C
O-Ring replacement kit 200974200150
Weight: 0.260 Kg.



*** = max.admitted pressure when used into power pack bodies: 230 bar



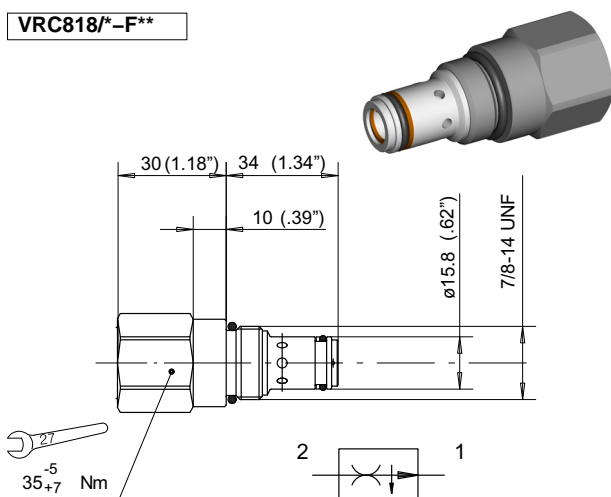
A heat-shrinkable sheath can be supplied, if requested to prevent the valve being tampered with.

When ordering, state in full the sheath part number, and, if the valve is to be supplied with sheath already fitted, the flow value setting required.

Setting range	Type	Code
1-6 l/min.	VRC818/A-R	200787200830
5-30 l/min.	VRC818/B-R	200787200840

Fixed version

VRC818/*-F**

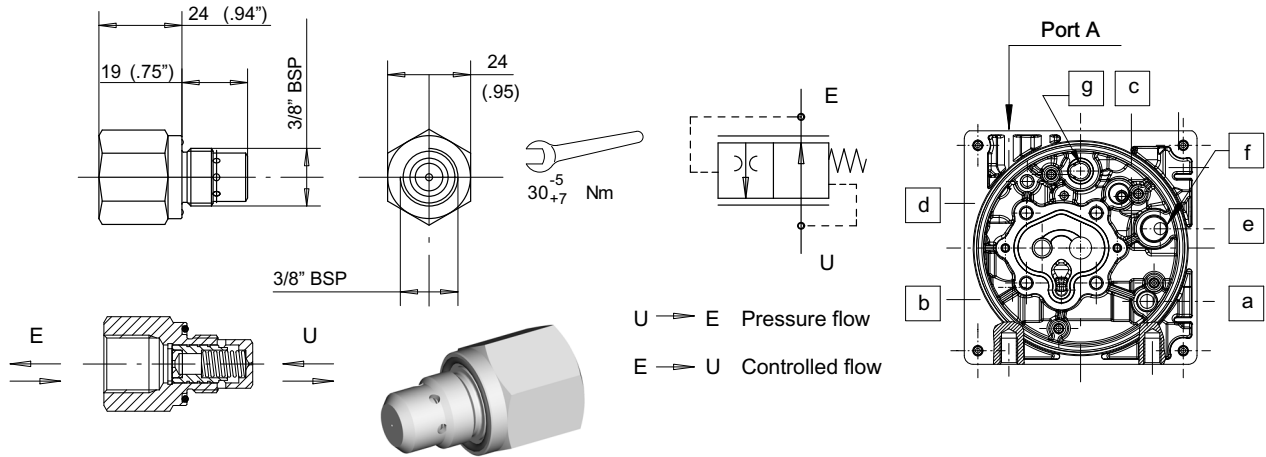


Nominal flow (l/min) ±12%	Type	Code
10	VRC818/D-F10	200787201490
12	VRC818/C-F12	200787200850
20	VRC818/B-F20	200787200970
30	VRC818/B-F30	200787201030

7.8.3 Flow control valve: VRC01/**

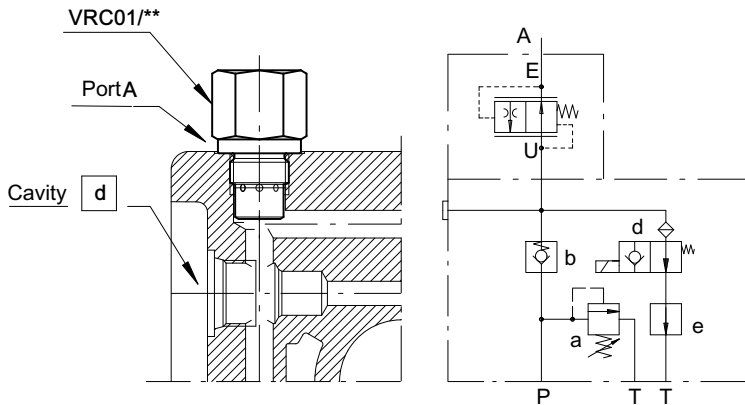
Compensated
 Fixed setting
 Seven pre-set flow values
 Flow from E to U
 Max. pressure 230 bar
 Controlled flow rate see table

Tolerance: ± 15%
 Performances see VRC818/*F
 Temperature range -20/+90 °C
 Weight: 0.060 Kg.
 Max. U-E flow rate = max. + 30% of E-U flow



The VRC01 flow control valve can be installed in any power pack housing with 3/8" BSP pressure port E.G.

Type **UP100K1G3** housing.



The VRC01 can be utilized in all those applications which make use of a normally open solenoid operated unloading valve. With this arrangement, pump flow is unloaded to tank with the lowest pressure drop.

In view of the particular type of construction, it is important not to exceed the indicated ratio between pressure flow (free reverse flow through the valve) and the controlled flow when unloading.

	Nominal flow	Ø X	Type	Code
	2 l/min.	1.25	VRC01/2	200787200030
	3 l/min.	1.50	VRC01/3	200787200040
	4 l/min.	2.00	VRC01/4	200787200050
	5 l/min.	2.25	VRC01/5	200787200060
	6 l/min.	2.50	VRC01/6	200787200070
	9 l/min.	3.00	VRC01/9	200787200080
	11 l/min.	3.50	VRC01/11	200787200010

7.8.4 Flow control valve: VRC 127/**-F (for K7 only)

Ball type

Flow from 2 to 1

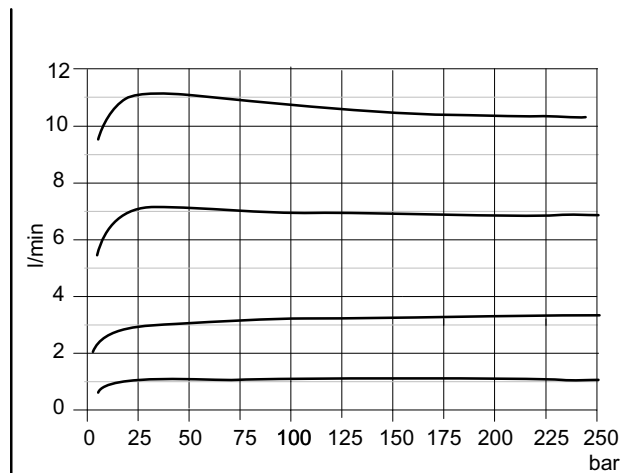
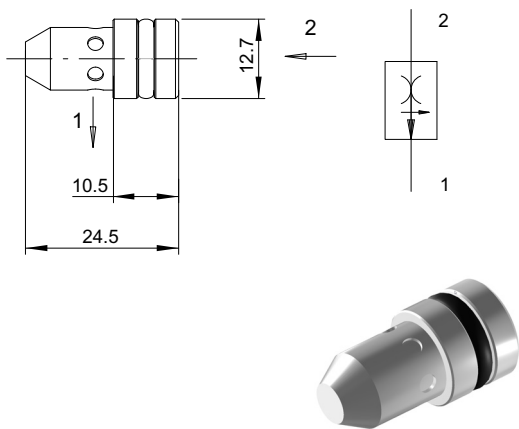
Max. pressure (***) 250 bar

Temperature range -20/+90 °C

Weight 0.013 Kg

Flow tolerance ±10%

Nominal flow	Setting	Type	Code
4 l/min	04	VRC127/04-F	200533920056
6 l/min	06	VRC127/06-F	200533920057
7 l/min	07	VRC127/07-F	200533920058
9 l/min	09	VRC127/09-F	200533920059
10 l/min	10	VRC127/10-F	200533920060
11 l/min	11	VRC127/11-F	200533920061
12 l/min	12	VRC127/12-F	200533920062



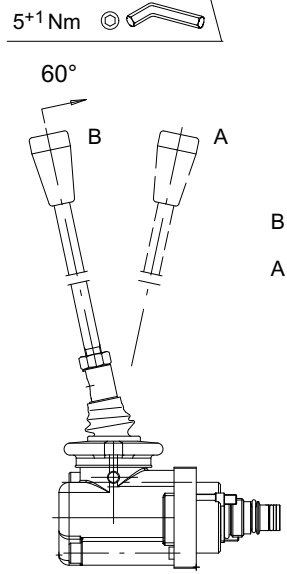
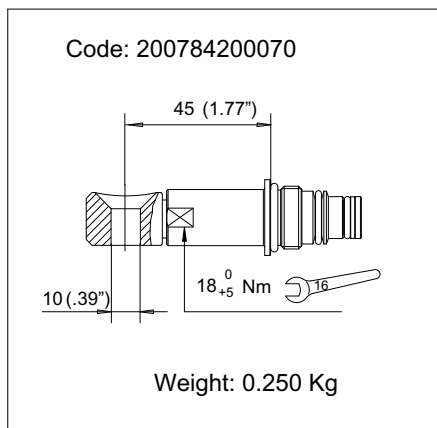
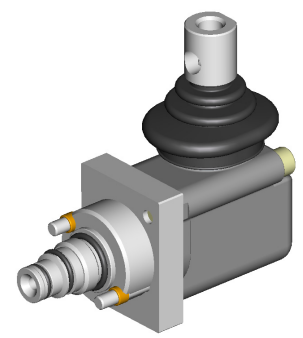
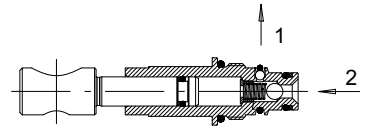
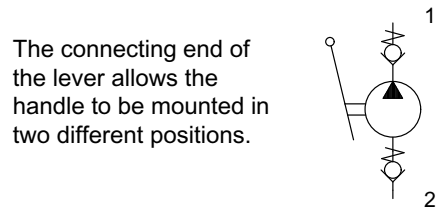
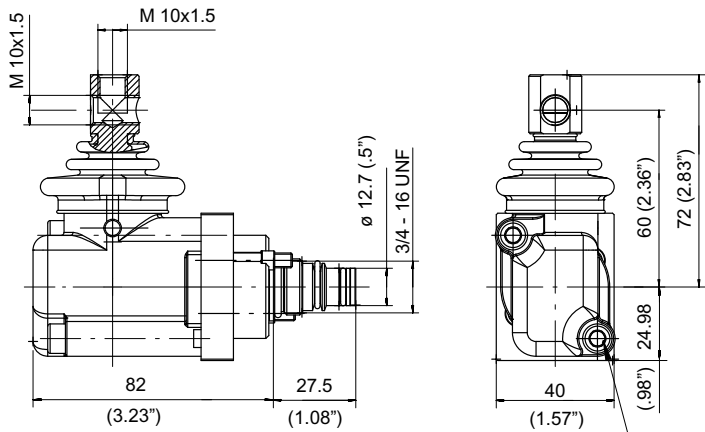
*** = max.admitted pressure when used into power pack bodies: 230 bar

7.9 Emergency hand pump: PM817/1.5

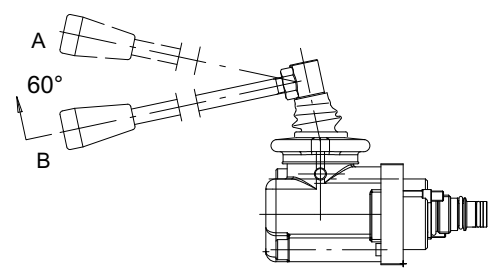
7.9.1 Emergency hand pump: PM817/1.5

For housings:
 UP100/K1G2-19 and UP100K4P0-01
 Inlet check
 Outlet check
 Ball type
 Code 200948200080

Max. recommended pressure 210 bar
 Displacement 1.5 cm³
 Internal leakage 0-5 drops/min.
 Temperature range -20/+90 °C
 O-Ring replacement kit 200974200340

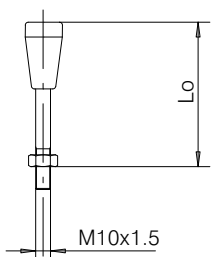
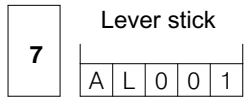


B → A = Inlet
 A → B = Outlet



Mounting positions: L10-L12-L14-L16 (see 7.9.2)

Lever stick



L ₀ Length	Type	Code
190 mm - 7.48 inches	AL001	200702220010
255 mm - 10.04 inches	AL002	200702220030
300 mm - 11.81 inches	AL003	200702220040
350 mm - 13.78 inches	AL004	200702220050

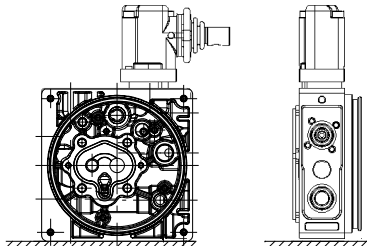
7.9.2 Emergency hand pump PM817/1.5 positions

Mounting allowed in housing type **K1G2-19** Cavity

c

	Type of housing	Vers.
1	U P 1 0 0 K 1 G 2	1 9

	Cavity C
7	P M 8 1 7 / 1 . 5

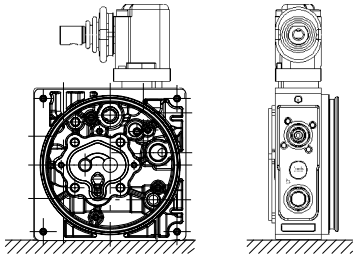


Hand lever

L	1	0
---	---	---

Lever stick

A	L	0	0	*
---	---	---	---	---

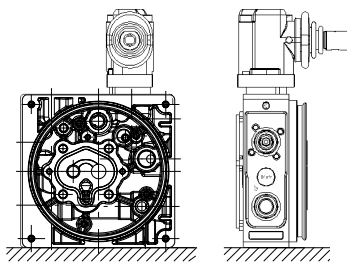


Hand Lever

L	1	2
---	---	---

Lever stick

A	L	0	0	*
---	---	---	---	---

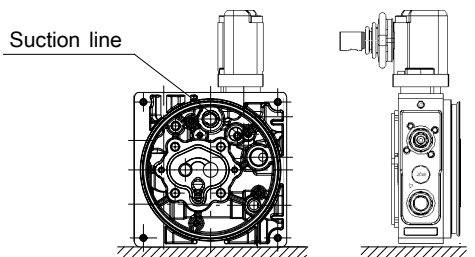


Hand lever

L	1	4
---	---	---

Lever stick

A	L	0	0	*
---	---	---	---	---



Hand lever

L	1	6
---	---	---

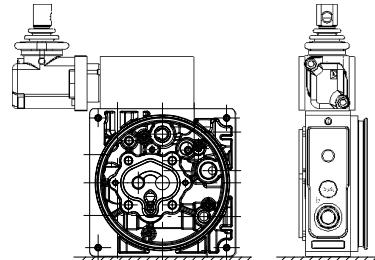
Lever stick

A	L	0	0	*
---	---	---	---	---

Mounting allowed in housing type **K3P0-01** with manifold **4217**

	Type of housing	Vers.
1	U P 1 0 0 K 3 P 0	0 1

	Cavity	Manifold
7	P M 8 1 7 / 1 . 5	8 4 2 1 7

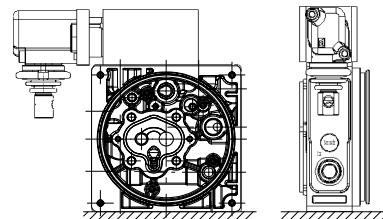


Hand lever

L	1	0
---	---	---

Lever stick

A	L	0	0	*
---	---	---	---	---

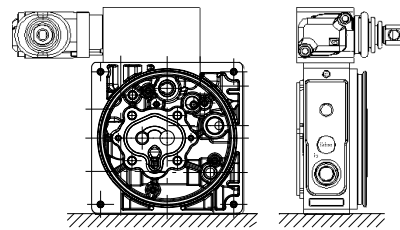


Hand lever

L	1	2
---	---	---

Lever stick

A	L	0	0	*
---	---	---	---	---

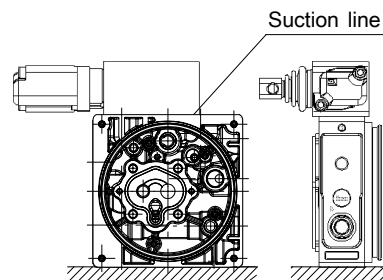


Hand lever

L	1	4
---	---	---

Lever stick

A	L	0	0	*
---	---	---	---	---



Hand lever

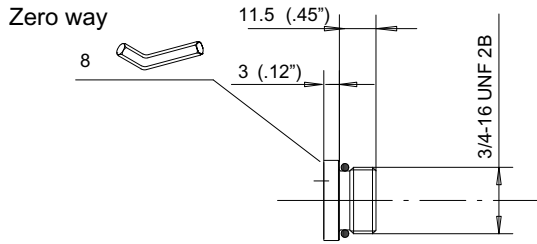
L	1	6
---	---	---

Lever stick

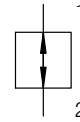
A	L	0	0	*
---	---	---	---	---

7.10 Valve cavity plugs

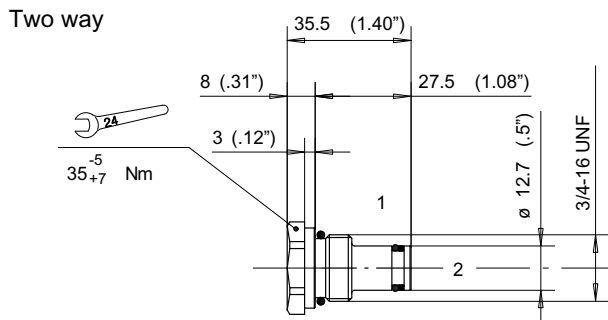
7.10.1 Valve cavity plug T817/0



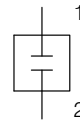
Code	200527481701
O-Ring code	200514224711
Weight	0.040 Kg.



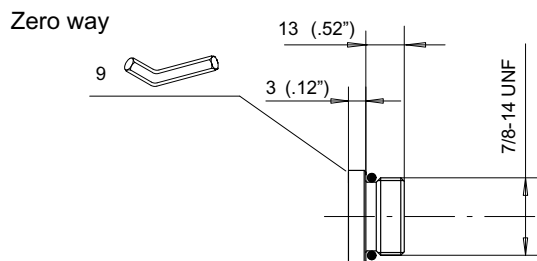
7.10.2 Valve cavity plug T817/2



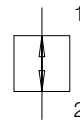
Code	200778800020
Seal kit code	200974200160
Weight	0.070 Kg.



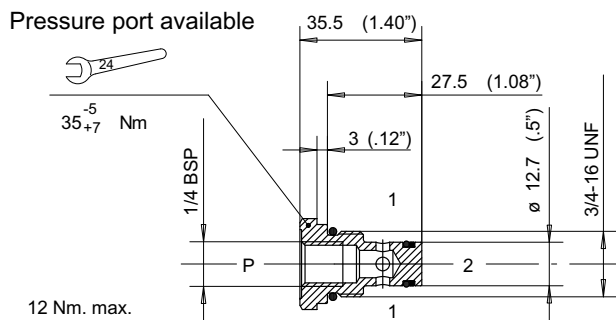
7.10.3 Valve cavity plug T818/0



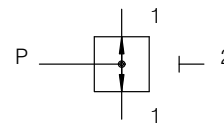
Code	200527481801
O-Ring code	200514231511
Weight	0.080 Kg.



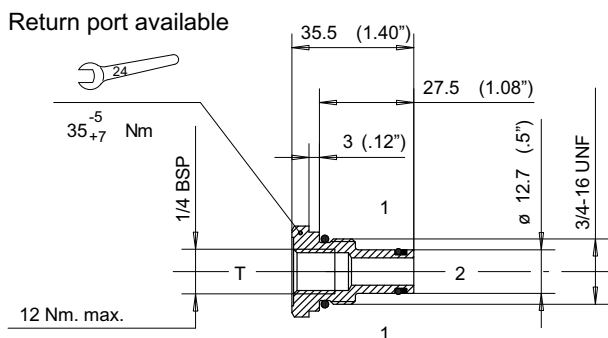
7.10.4 Valve cavity plug T817/2P-602



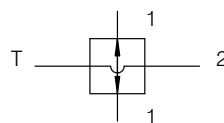
Code	200778800060
Seal kit code	200974200160
Weight	0.040 Kg.



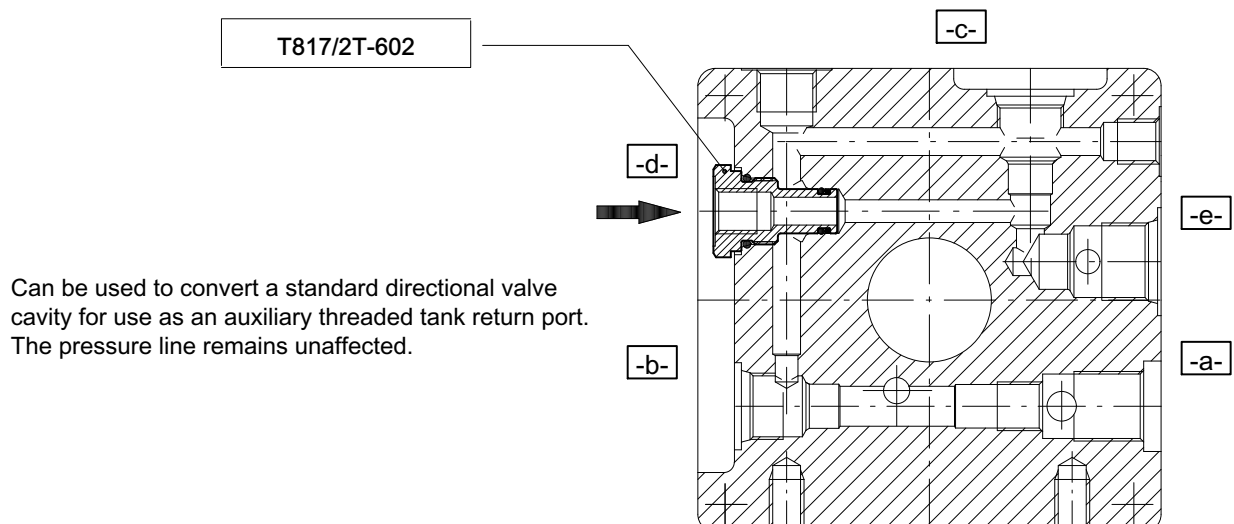
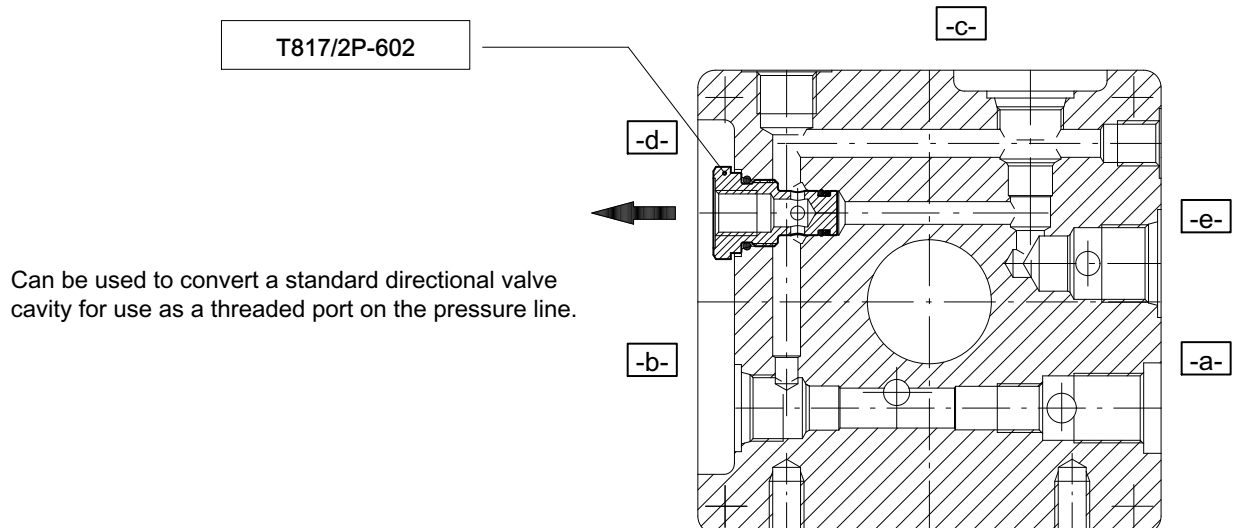
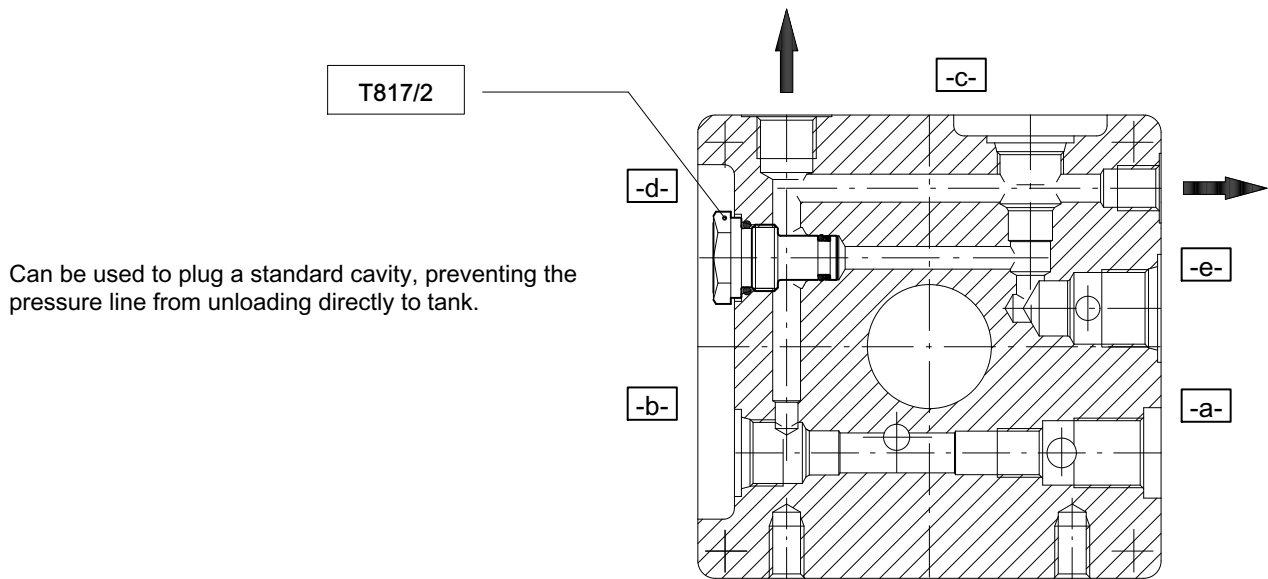
7.10.5 Valve cavity plug T817/2T-602



Code	200778800070
Seal kit code	200974200160
Weight	0.030 Kg.



7.10.6 Example of plugs fitted into valve cavities



8 Manifolds

8.1 Technical information

Power pack housings K3 and K4 can be connected directly or in combination with manifolds, allowing the assembly of complex circuits in compact and modular solution.

Standard manifolds

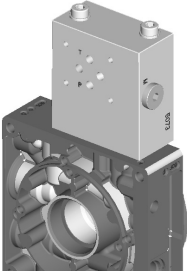
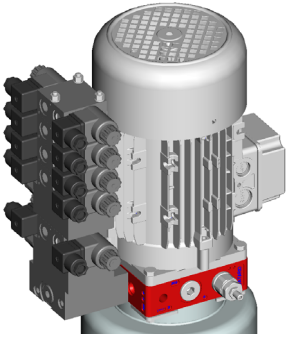
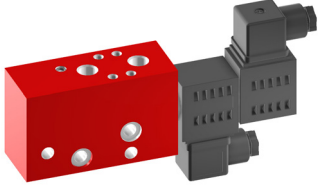
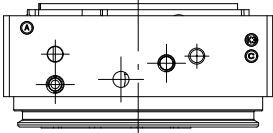
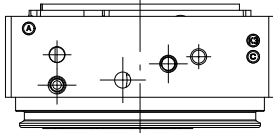
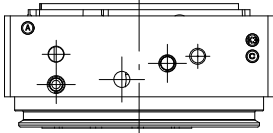
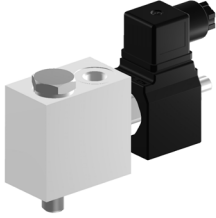
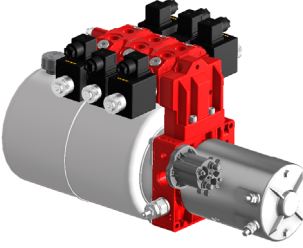
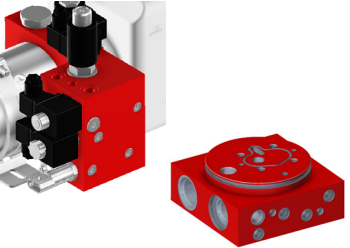
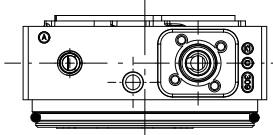
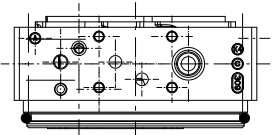
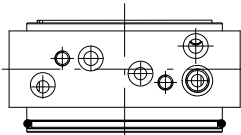
The range includes monobloc or sectional manifolds with which to create parallel or series circuits for cartridge type solenoid valves or CETOP R35H design.

Take care to verify the position of the filling plug of the chosen tank avoiding version having interference with the valve block. As alternative stackable solutions are available.

Special manifolds

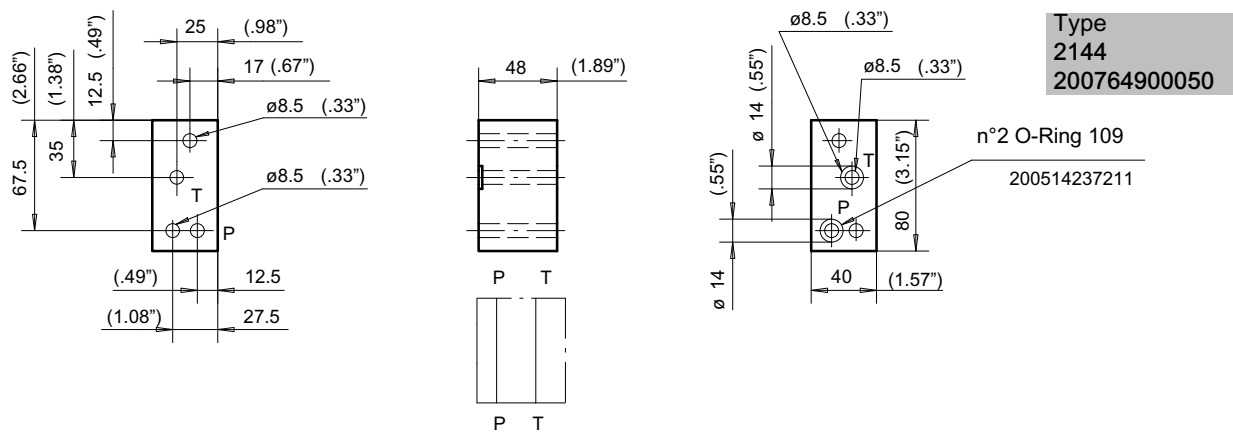
To reduce the dimensions and complexity of the system generally (connecting pipe-lines, etc.) special manifolds can be designed and manufactured to meet particular requirements.

These fully customized manifolds, complete with valves, will incorporate the required hydraulic circuit in its entirety while meeting the dimensional and positional requirements specified by the customer.

TYPE	CETOP3 R35H-ISO4401	Stackable	Modular
Example			
UP100 interface			
UP100 type	UP100K3P0-01 UP100K4P0-01	UP100K3P0-01 UP100K4P0-01	UP100K3P0-01 UP100K4P0-01
Section	8.2	8.3	8.4
TYPE	Manifold fitted by threaded fitting	HDS11 ON-OFF HDS07 ON-OFF	Special blocks dedicated/ Power pack bodies
Example			
UP100 interface			
UP100 type	UP100K1G2* UP100K4G2*	UP100K4D0-01	UP100K9*
Section	8.5	8.6	8.7 - 8.8 - 9

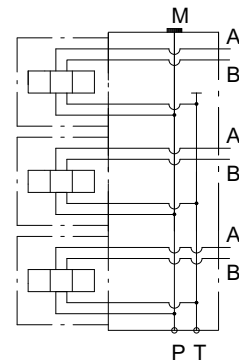
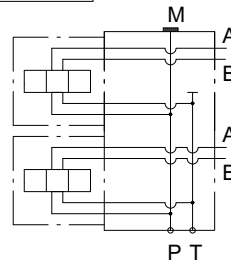
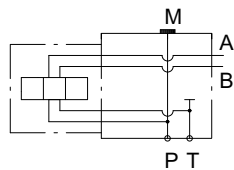
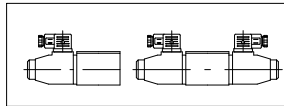
8.2 CETOP3 R35H-ISO4401

8.2.1 Intermediate plate 2144 for manifolds 5073-5033-5053-2083-2043-2013



8.2.2 Parallel circuit - Monobloc manifolds 1-2-3 for solenoid valves DIN24350 FORM A CETOP R35H-ISO4401

A-B ports	3/8" BSP
Port M (plugged)	1/4" BSP



Rear A/B ports : **5073** 200764600030

5033 200764600080

5053 200764601080

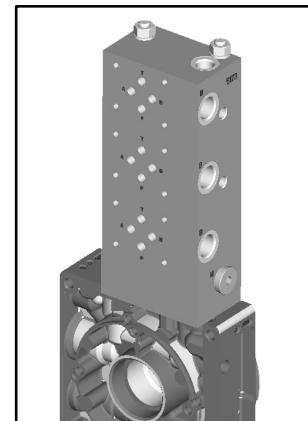
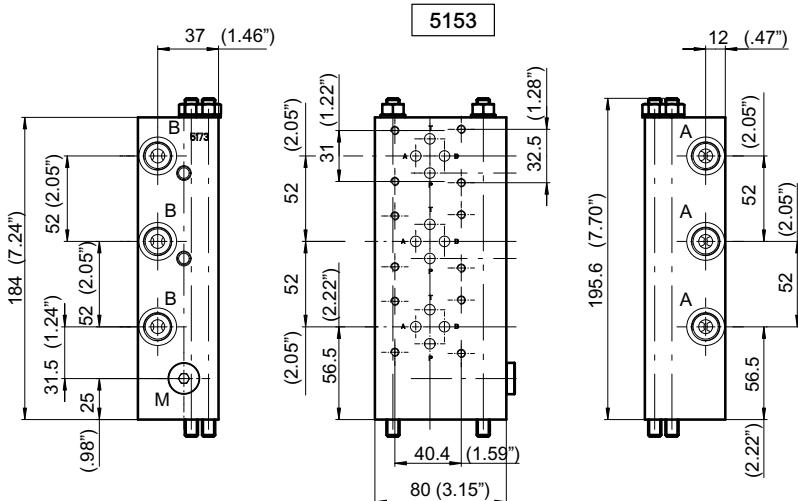
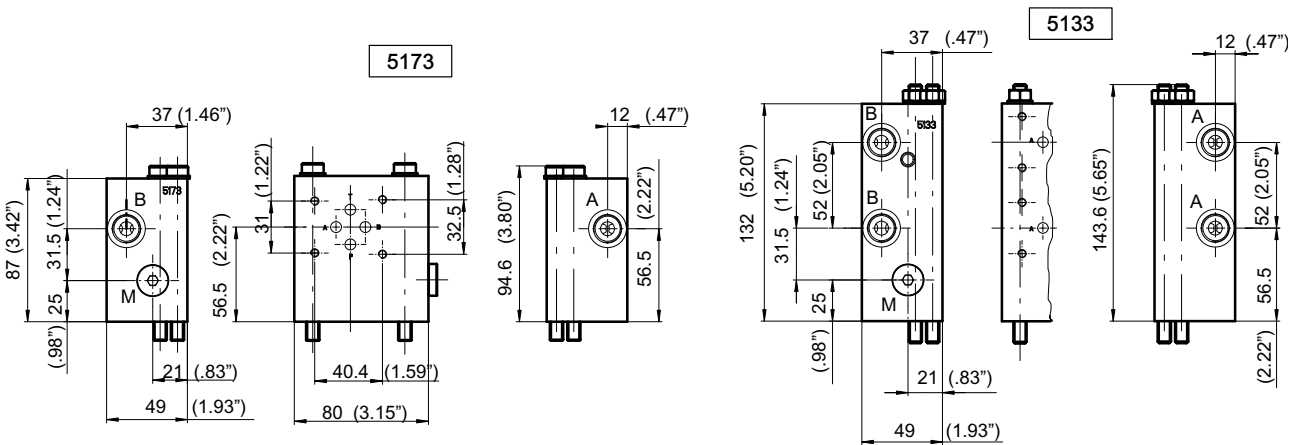
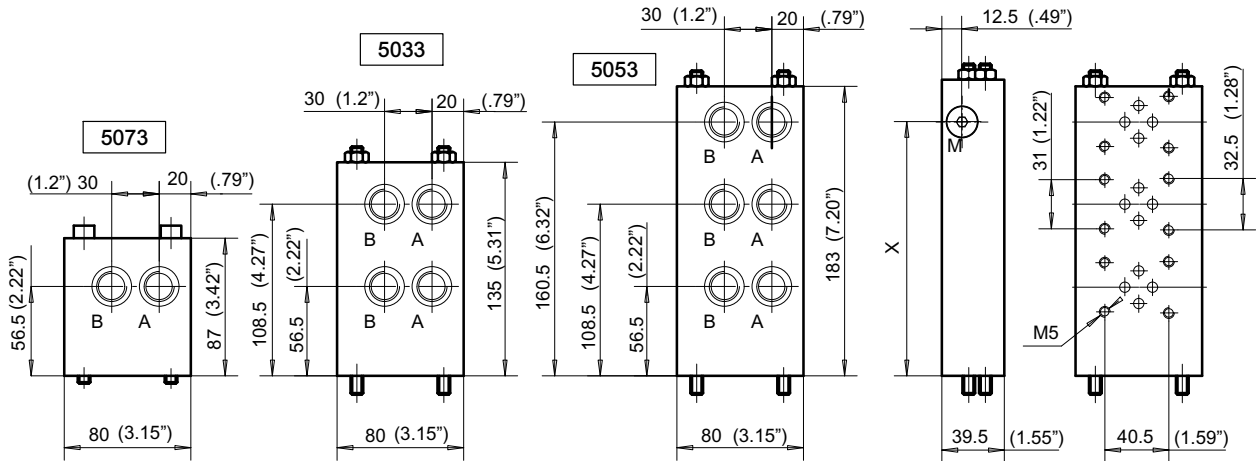
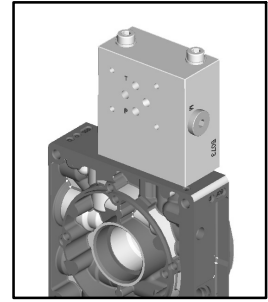
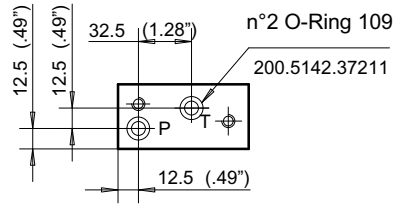
Lateral A/B ports : **5173** 200764600020

5133 200764600040

5153 200764600050

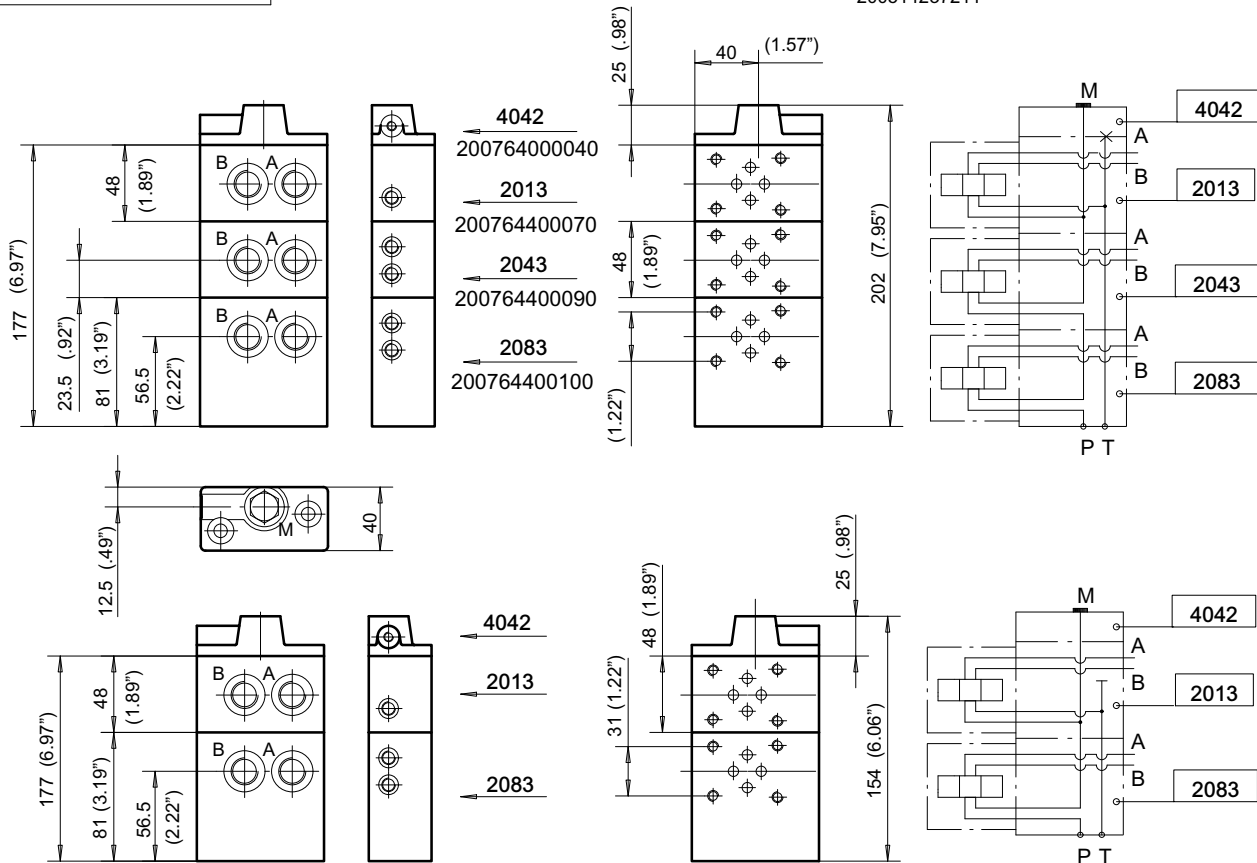
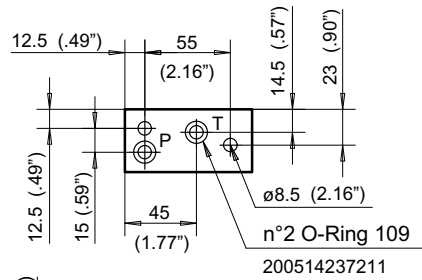
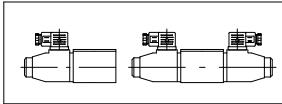
* for versions with 4 and more solenoid valves please contact our Sales Center

Type	Manometer port
5073	X = 48 (1,89")
5033	X = 100 (3,94")
5053	X = 152 (5,98")



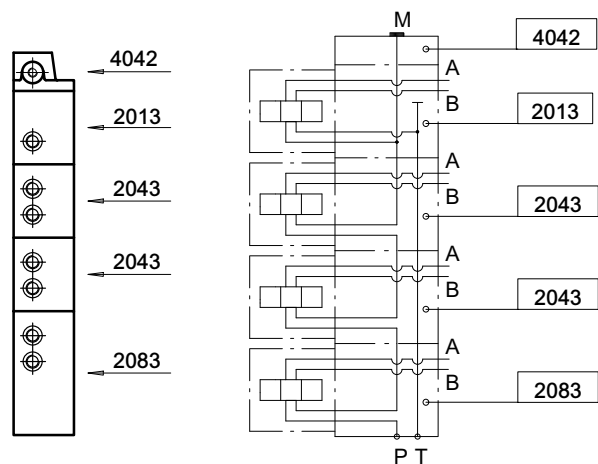
**8.2.3 Series circuit - Suitable for solenoid valves
DIN24350 FORM A CETOP R35H - ISO4401**

A-B ports	3/8" BSP
Port M (plugged)	1/4" BSP

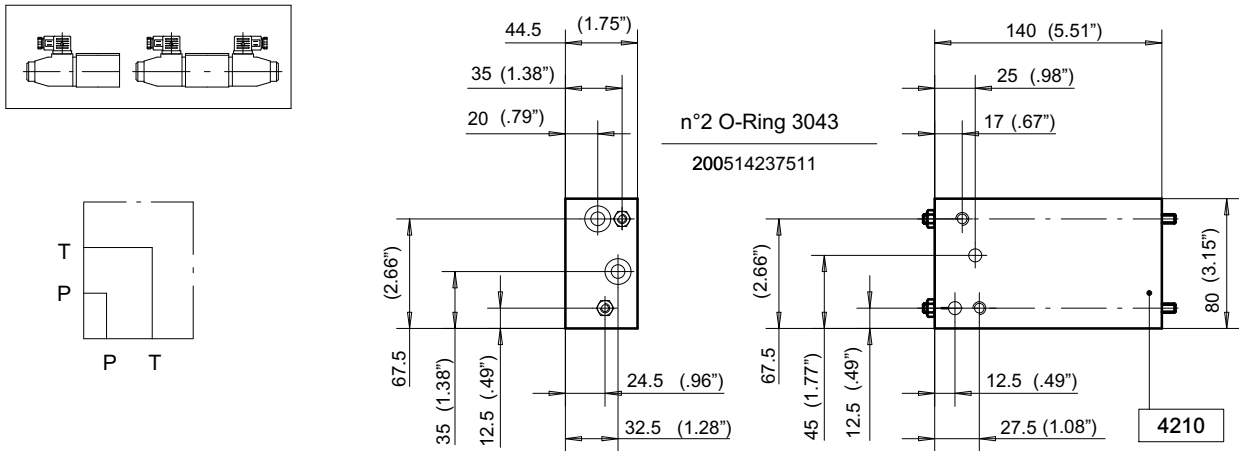


**8.2.4 Series circuit - Circuit with more than three solenoid valves
DIN24350 FORM A CETOP R35H - ISO4401**

To obtain a hydraulic circuit with more than 3 solenoid valves (DIN24350 FORM A CETOP R35H - ISO4401) connected together, simply add one or more 2043 type manifolds as required. The hydraulic diagram shows an arrangement with 4 solenoid valves

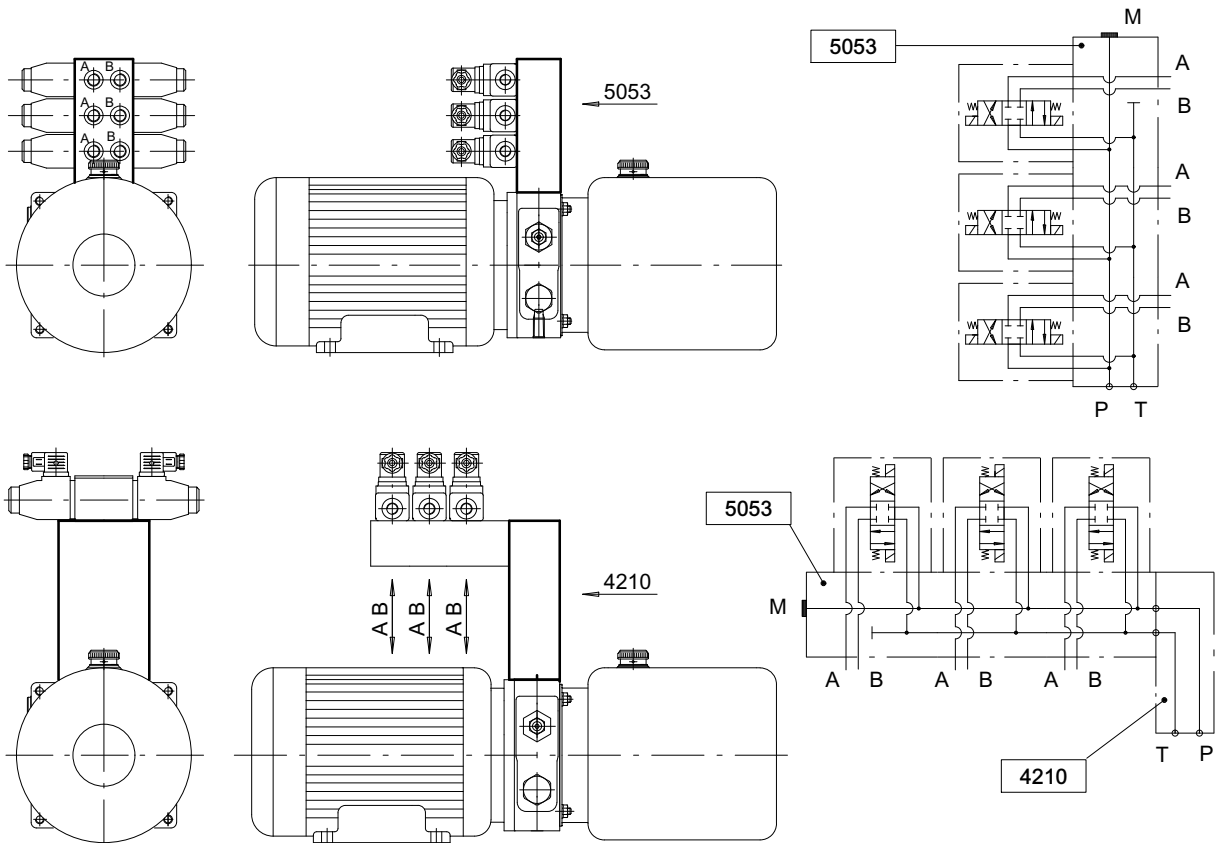


8.2.5 Spacer plate 4210 for manifolds: 5073- 5033-5053-2083-2043-2013 DIN24350 FORM A CETOP R35H-ISO4401



Code: 200764900160

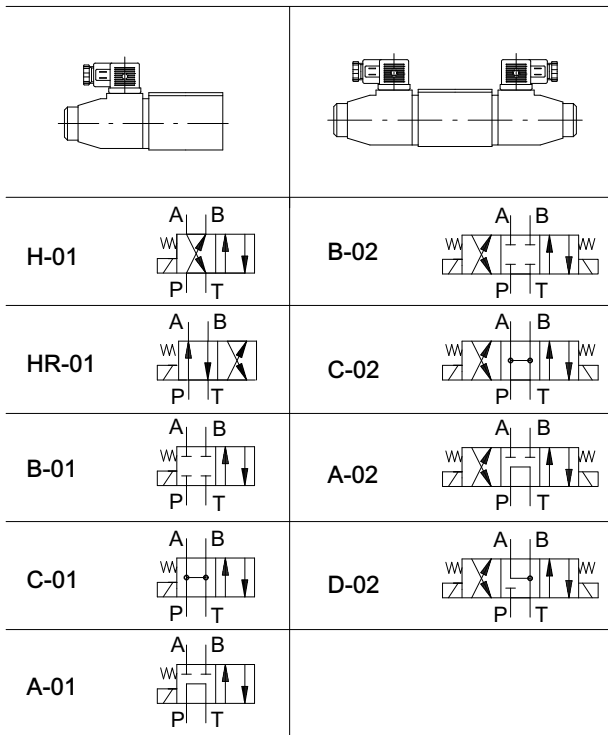
Mounting and ordering examples



Example

8	Sequence		Manifolds				Valves for manifolds										Q.ty		Volt	
	1	2	4	2	1	0													1	3
			5	0	5	3													3	

8.2.6 Solenoid valves DIN 24350 FORM A CETOP R35H - ISO4401*



Max. pressure	210 bar
Max. flow	25 l/min.
Intermittence	ED = 100%
Voltage tolerance	± 10%
Leakage	15/60 cm ³ /min.
Connector type	DIN 43650

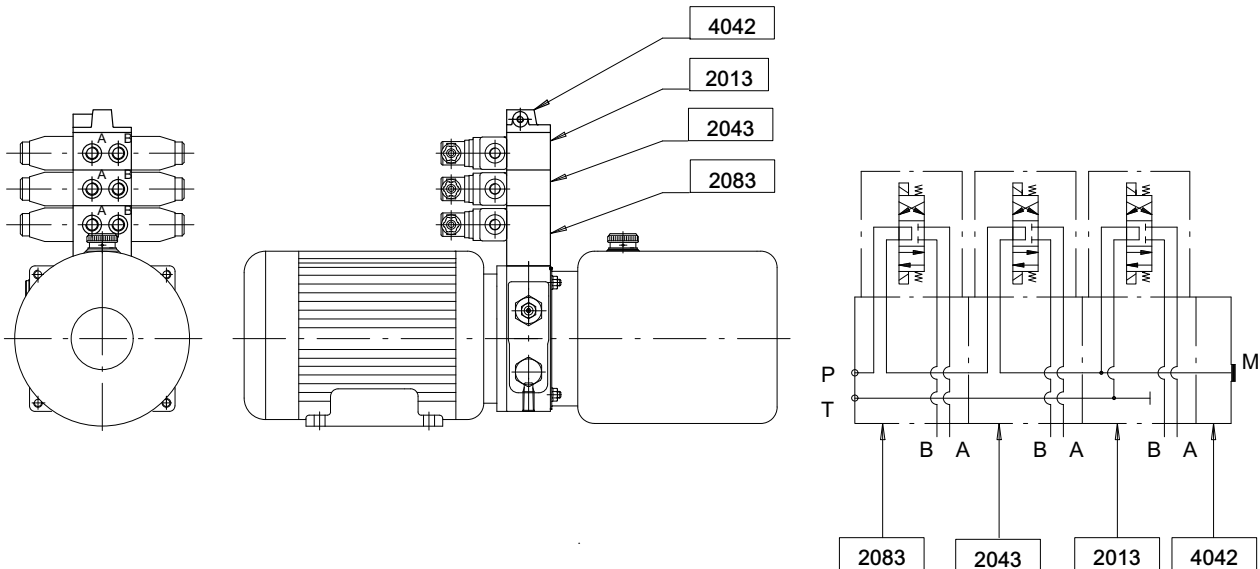
D.C. Coils

A.C. Coils

Voltage	Type
12 V.	13
24 V.	23

Voltage	Type
24 V.	21
110 V.	41
220 V.	51

* Please contact our Sales Dept. for hydraulic circuit not indicated

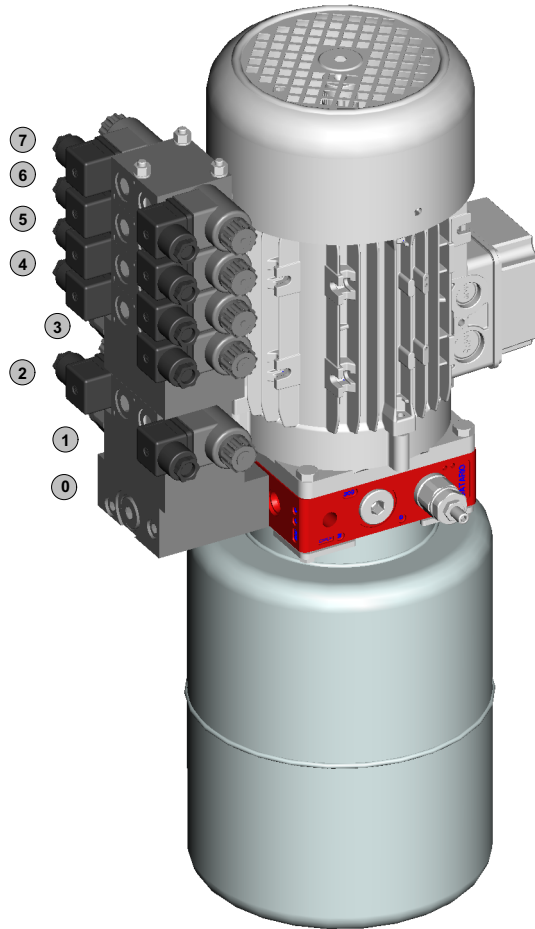


	Sequence		Manifolds				Valves for manifolds								Q.ty	Volt				
	1	2	2	0	8	3	A	-	0	2										
8	1		2	0	8	3	A	-	0	2									1	1 3
	2		2	0	4	3	A	-	0	2									1	
	3		2	0	1	3	A	-	0	2									1	
	4		4	0	4	2													1	

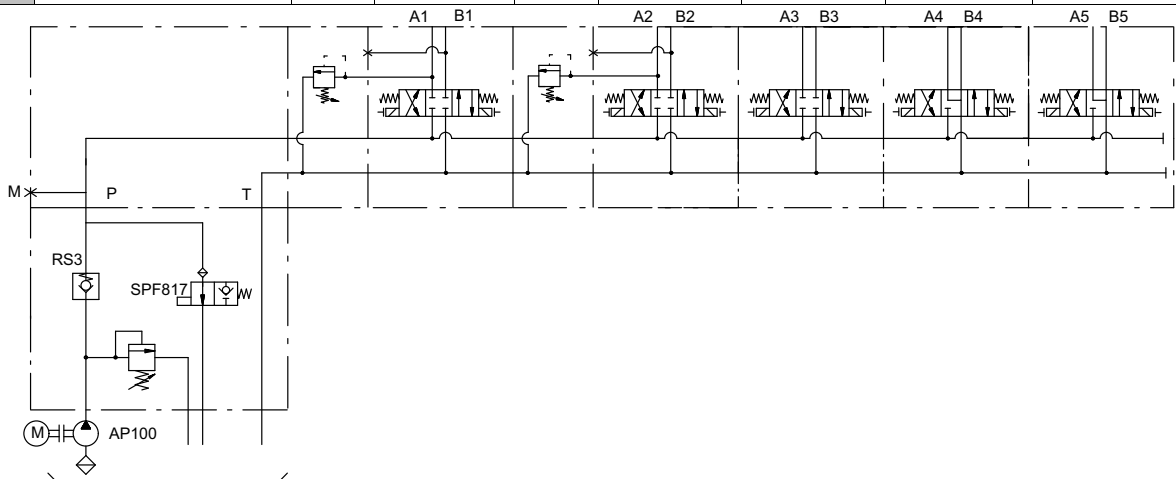
8.3 Stackable

8.3.1 Complete UP100 circuit example

Mounting allowed on UP100K3P0 or UP100K4P0....

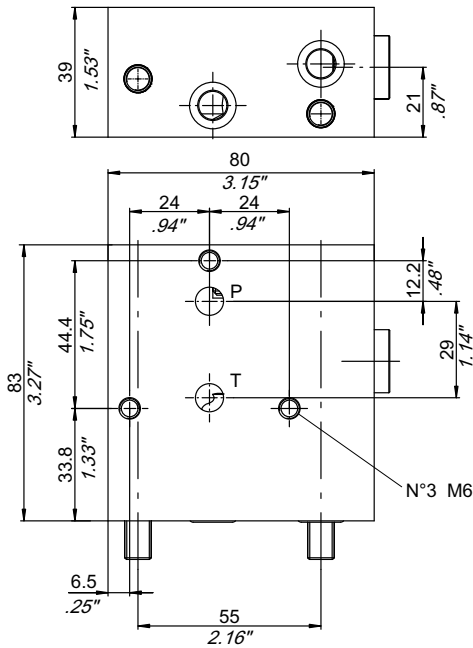


Position	0	1	2	3	4	5	6	7
Element type	ST1	VMC 01-A-***	P1	VMC 01-A-***	P1	00	00	Z1
Circuit	-	-	B-02	-	B-02	B-02	D-02	D-02

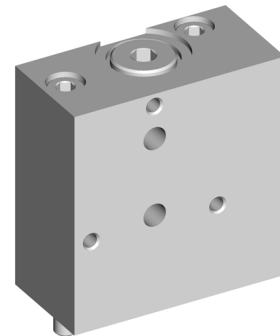
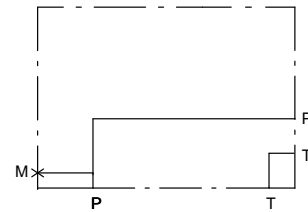


For other circuits available please contact our Sales Center.

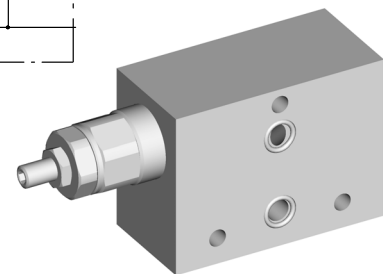
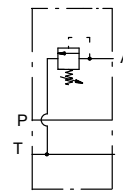
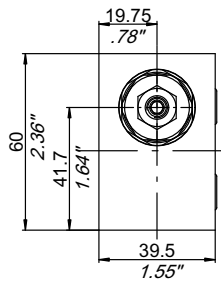
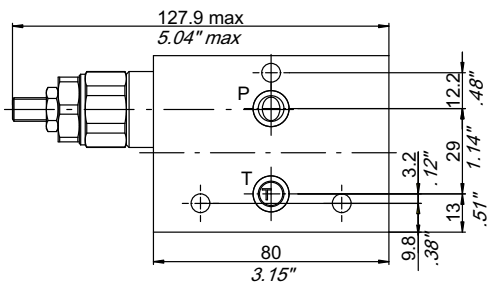
8.3.2 Intermediate manifold ST1



Code:
200703500360

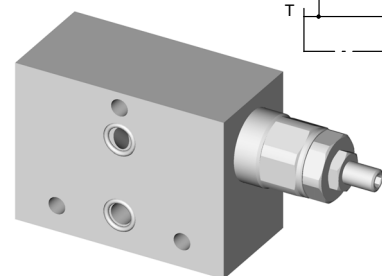
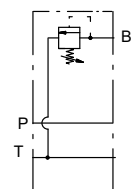
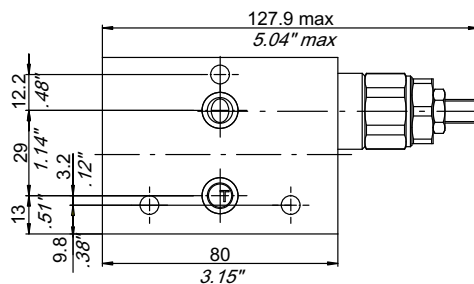
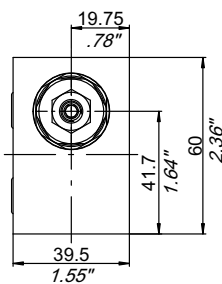


8.3.3 Intermediate manifold with anti-shock valve VM01C-A-*** (A port)



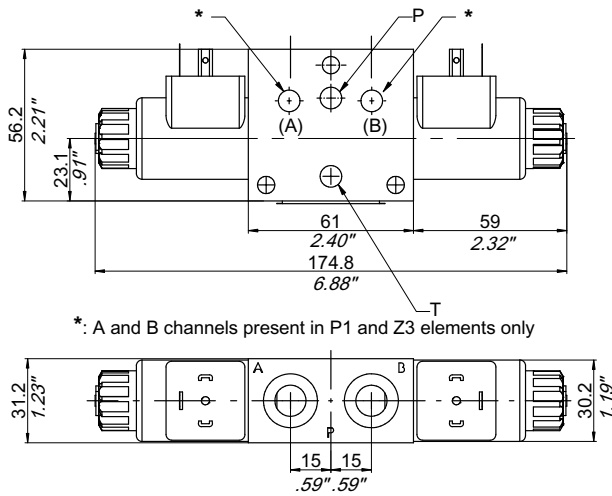
*** = Pressure setting value (i.e. 170= 170 bar). See section 7.2.1

8.3.4 Intermediate manifold with anti-shock valve VM01C-B-*** (B port)

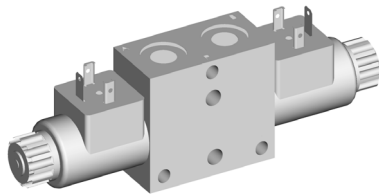


*** = Pressure setting value (i.e. 170= 170 bar). See section 7.2.1

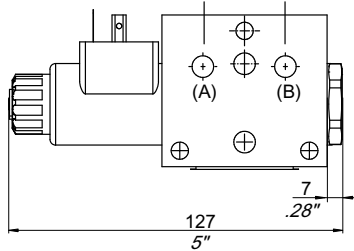
8.3.5 4/3, 4/2 directional valve



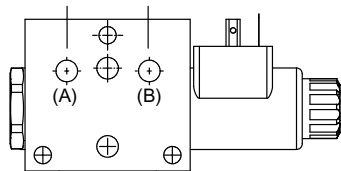
*: A and B channels present in P1 and Z3 elements only



Valve with one solenoid "A" - Circuits: A-01, B-01, HR-01



Valve with one solenoid "B" - Circuit: C-01



Circuit	Type	
	B-02-B	
	A-02-B	
	C-02-B	
	D-02-B	
	HR-01-B	
	A-01-B	
	B-01-B	
	C-01-B	

Performances

Port threads	1/4" BSP
Max. flow	20 l/min.
Max. operating pressure at ports P, A, B (***)	250 bar
Max. operating pressure at ports T	210 bar
Manual standard override	
Standard coil interface	EN 175301-803 (DIN 43650)
Voltage	12 - 24 V.DC.

8.3.6 Elements type

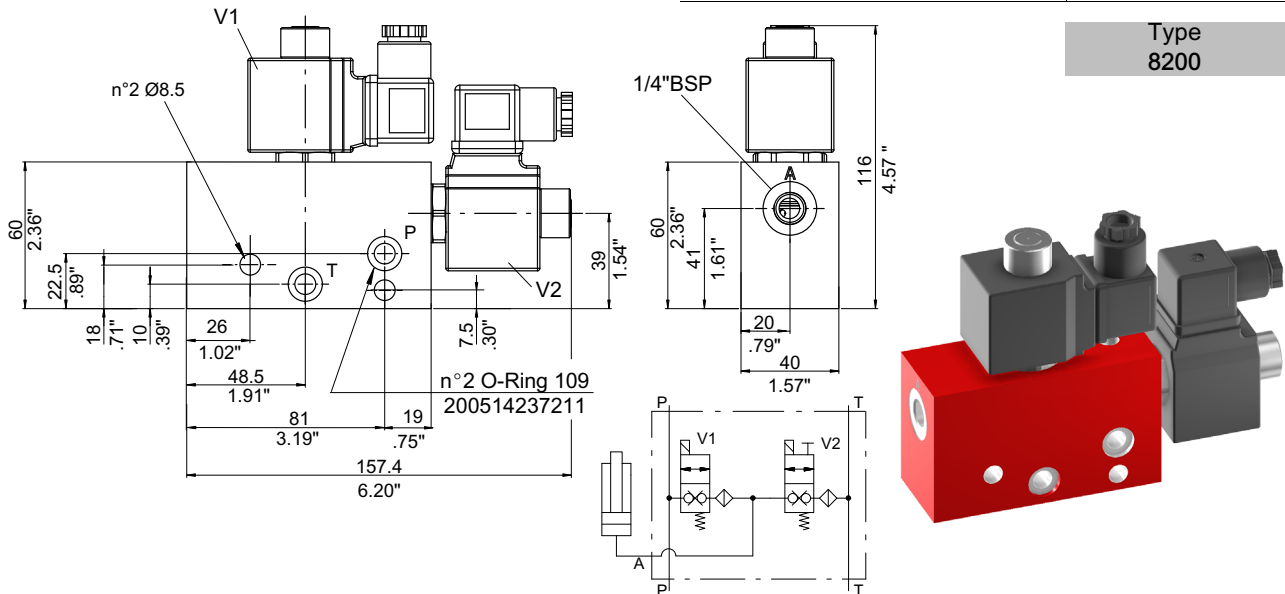
00 Standard element	P1 : through channels P, T; inlets A, B with sealing rings
Z1: one side inlets of channels P, T with sealing ring	Z3: one side inlets of channels P, T, A, B with sealing ring

*** = max.admitted pressure when used into power pack bodies: 230 bar

8.4 Modular manifolds series 8000

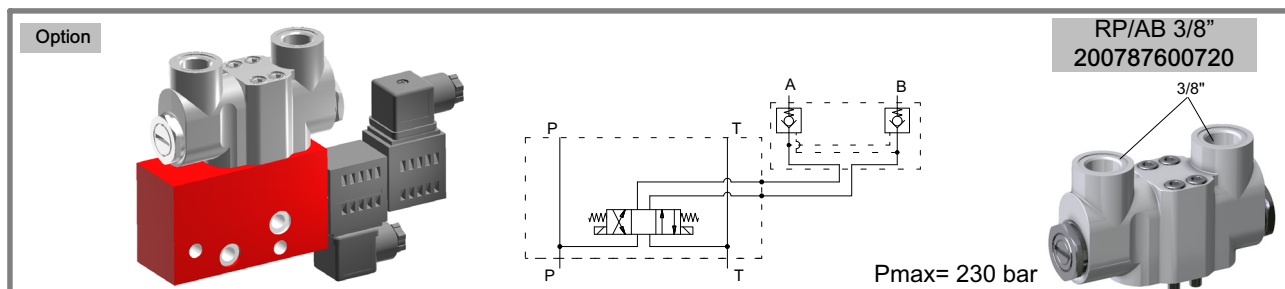
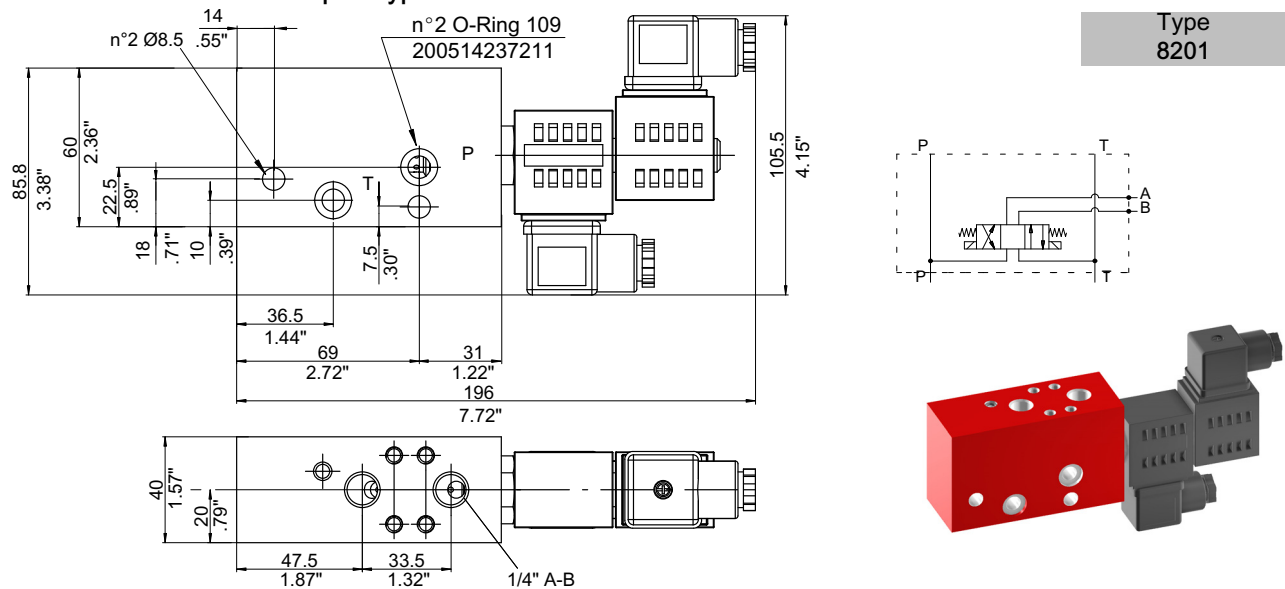
8.4.1 Manifold block for 2 solenoid valves and 1/4" BSPP port

Hydraulic performances	
Max. working pressure	230 bar
Flow rate Q max.	35 l/min



Minimum batches required, please contact our Sales Center.

8.4.2 Modular block with four way three position solenoid valve. Spool type



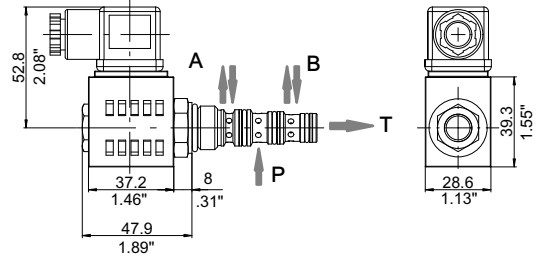
Minimum batches required, please contact our Sales Center.

8.4.2.1 Solenoid valves dedicated to 8201 manifold

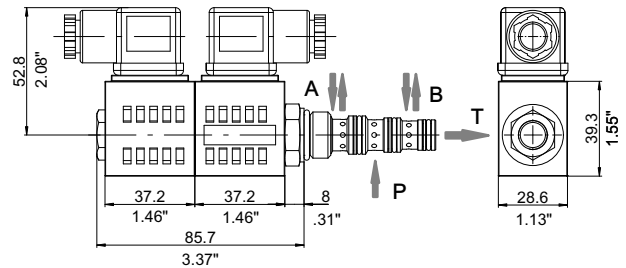
(For availability please consult our Sales Organisation)

Circuit	Type
	CH-01
	CB-01
	CA-01
	CI-01
	CB-02
	CC-02
	CA-02
	CD-02

4 ways, two positions



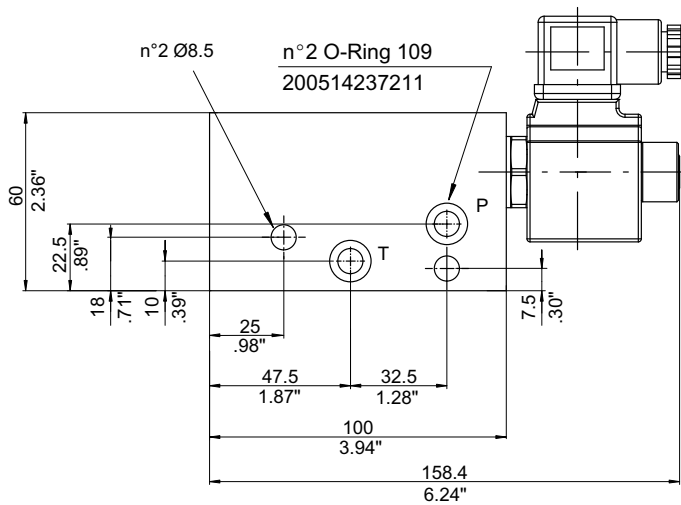
4 ways, three positions



Std. Voltage	Type	
12 V D.C.	13	Coil and connector features: see section 7.4.5 (SPD type) and 7.4.6
24 V D.C.	23	
24 V A.C.	21	
110 V A.C.	41	
220 V A.C.	51	

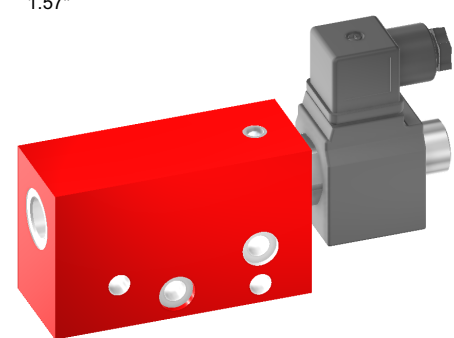
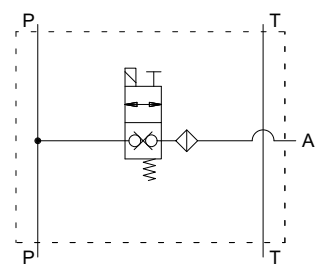
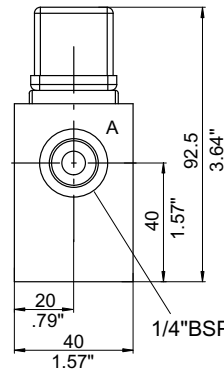
Hydraulic performances		
Max. pressure	210 bar	For higher pressure/flow rate values please contact our Sales Center
Max. flow	11 l/min	

8.4.3 Modular block with solenoid valve



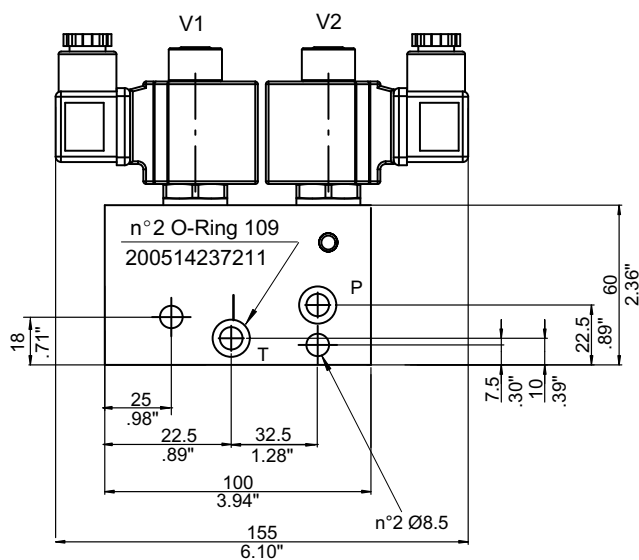
Hydraulic performances	
Max. working pressure	230 bar
Flow rate Q max.	15 l/min

Type
8203



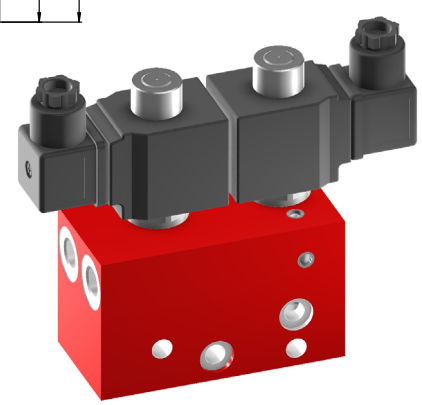
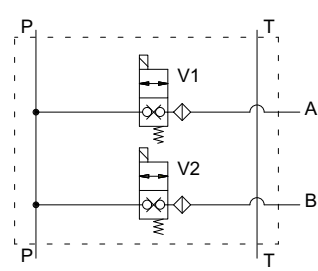
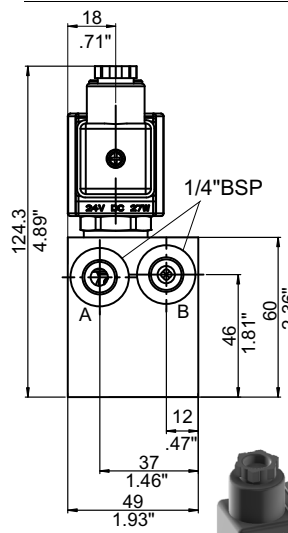
Minimum batches required, please contact our Sales Center.

8.4.4 Modular block with two solenoid valves



Hydraulic performances	
Max. working pressure	230 bar
Flow rate Q max.	15 l/min

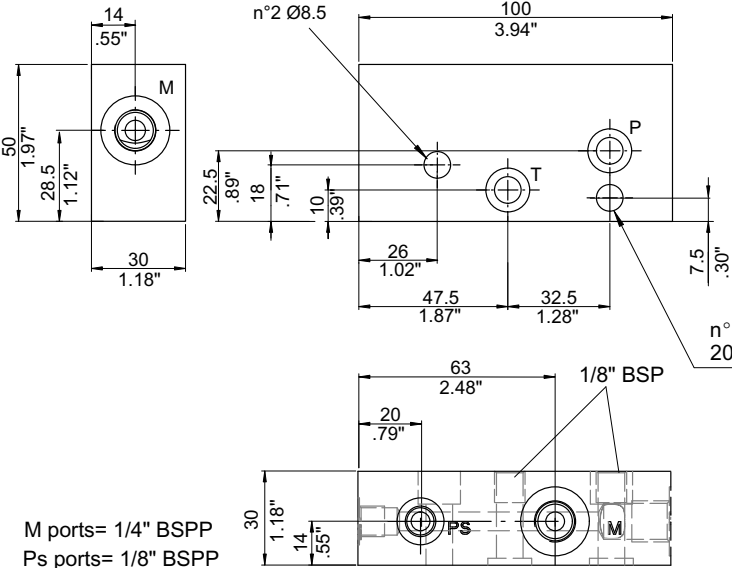
Type
8204



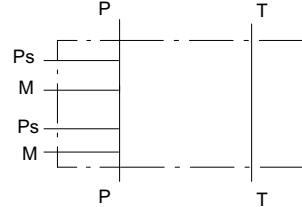
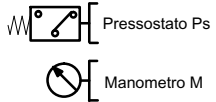
Minimum batches required, please contact our Sales Center.

8.4.5 Modular spacer with 4 auxiliary ports

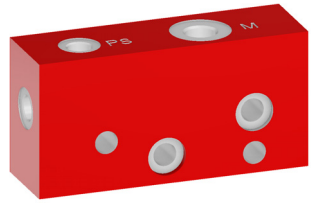
Type 8100



Example of circuit



n° 2 O-Ring 109 200514237211



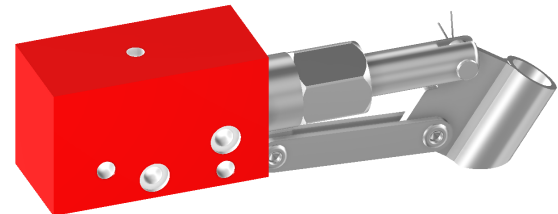
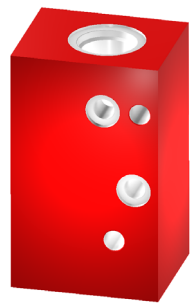
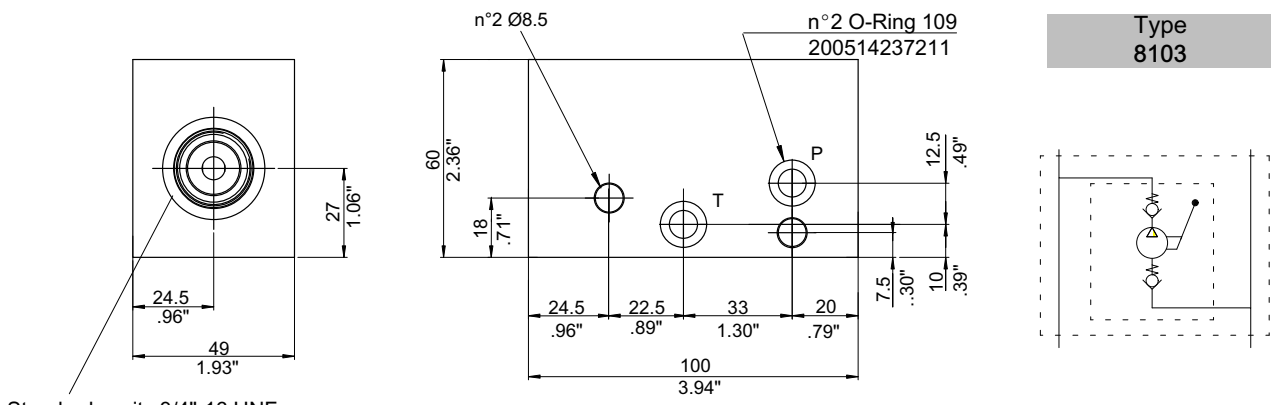
M ports= 1/4" BSPP
Ps ports= 1/8" BSPP

Minimum batches required, please contact our Sales Center.

8.4.6 Modular hand pump manifold block

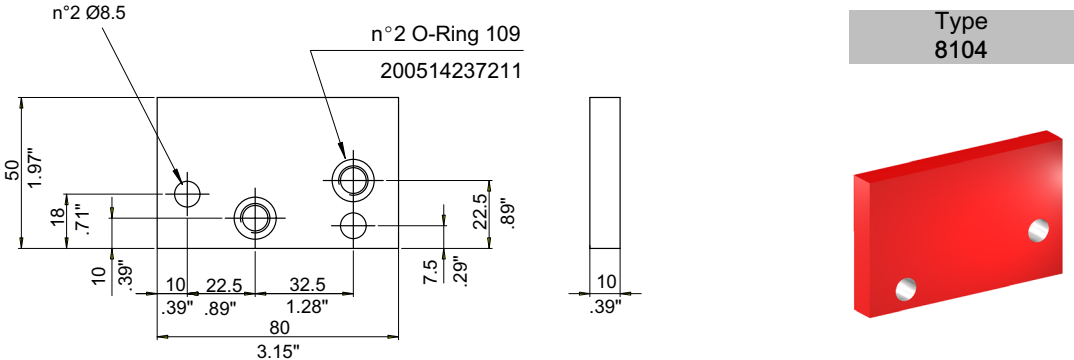
Hydraulic performances	
Max. working pressure	230 bar
Pump displacement	09 = 9.0 cm ³

Type
8103



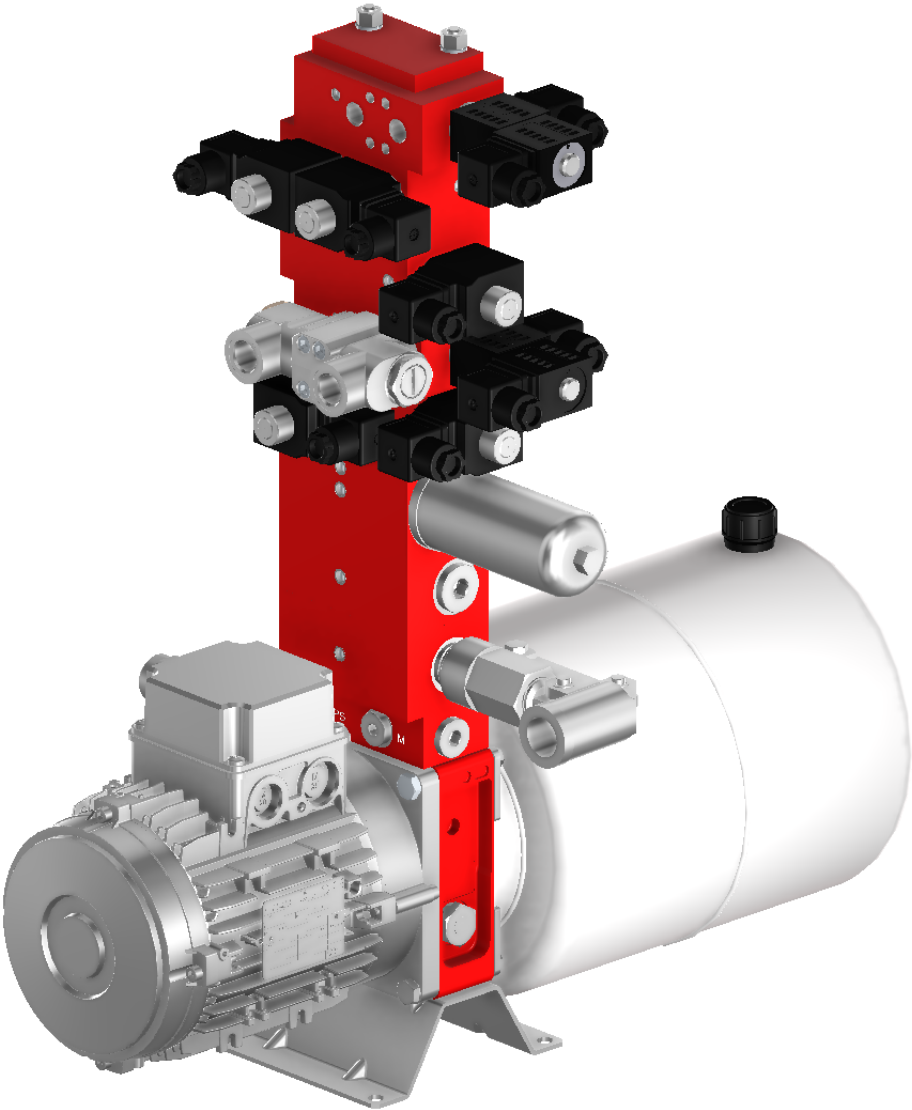
Minimum batches required, please contact our Sales Center.

8.4.7 End cover



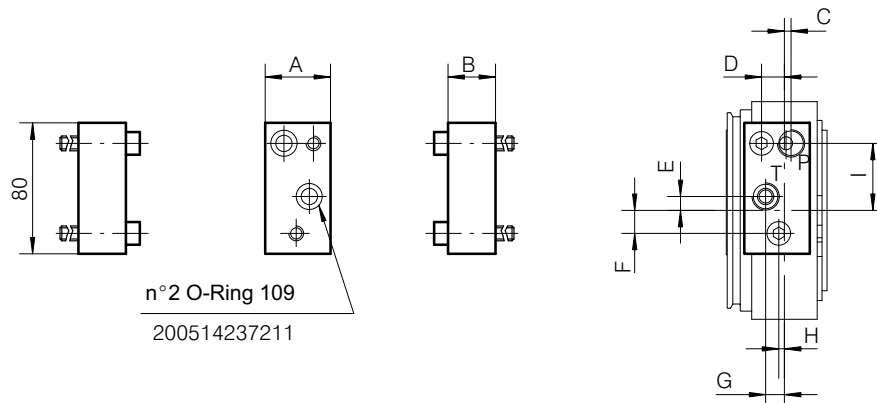
Minimum batches required, please contact our Sales Center.

8.4.8 Power pack example



Tie-rod lengths depending on number and type of modular manifolds, please contact our Sales Center.

8.4.9 Manifolds with direct thread ports P and T for K3P001 and K4P001 housings



Type
1012 - 1013

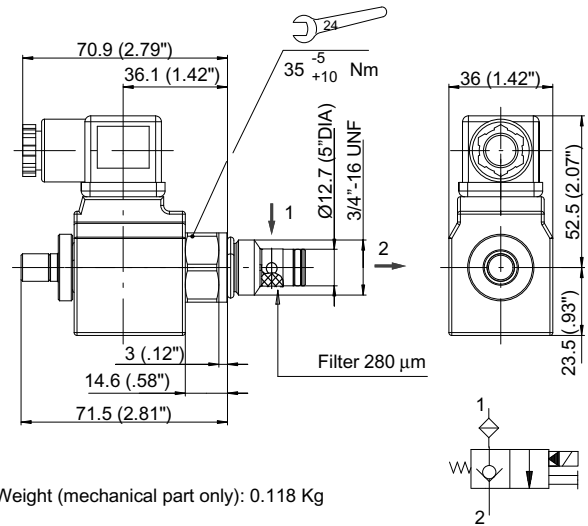
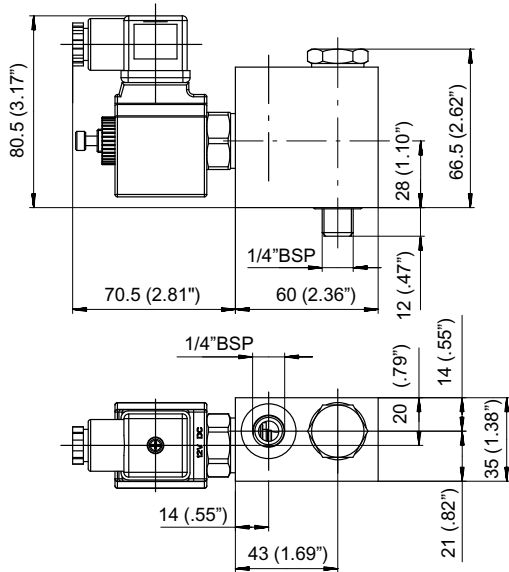
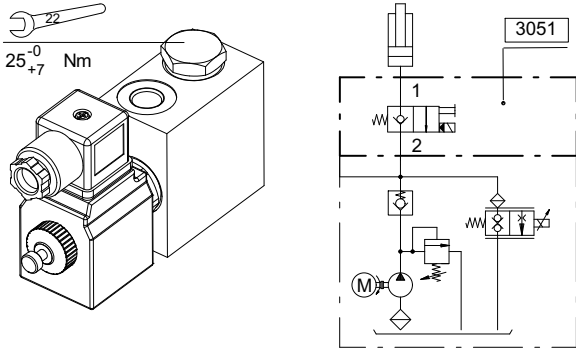
Ø (P/T)	Type	Code	A	B	C	D	E	F	G	H	I
1/4" BSP	1012	200765000620	40	30	3	14	8.5	14	11.5	3.5	41
3/8" BSP	1013	200765000600	40	29	4	14	8.5	14	11.5	3.5	41

8.5 Special blocks

8.5.1 Special block 3051

Pre-arranged for one SPFE817/22-TV solenoid valve.
 Valve block to be used in combination with the PDF817 solenoid proportional control valve in order to assure the load held at its stopped position and control the load speed proportionally, either during the lifting and lowering function.
 Suitable for housing UP100/K1G2* - UP100/K4G2*.

Normally closed
 Poppet type
 Piloted (27 W)
 Flow from 1 to 2
 With manual override (screw type)
 Manual override = unscrew to open



Weight (mechanical part only): 0.118 Kg

Type	Code
Block + Banjo	200703500261

A.C. supply requires connector with bridge rectifier included

8.5.2 Special block 3151

Pre-arranged for 2 x SDFE817/22-TH solenoid valve

The block allows to control, singly or together the lifting and lowering function of two single acting cylinders connected to the port A and B. Suitable for housing UP100/K1G2* - UP100/K4G2*. It could be only assembled on K housings main work port A.

Normally closed

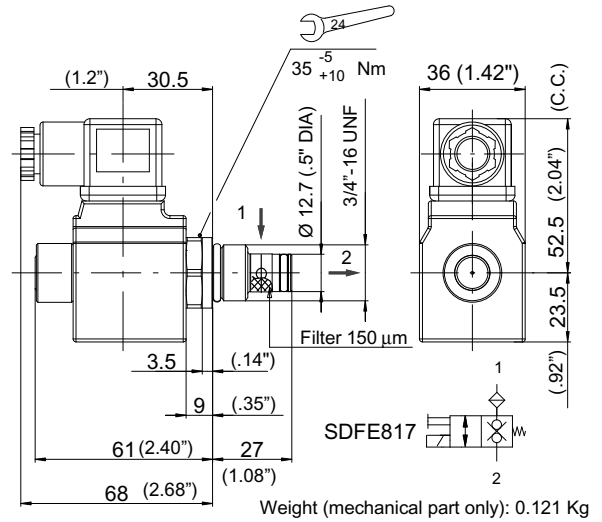
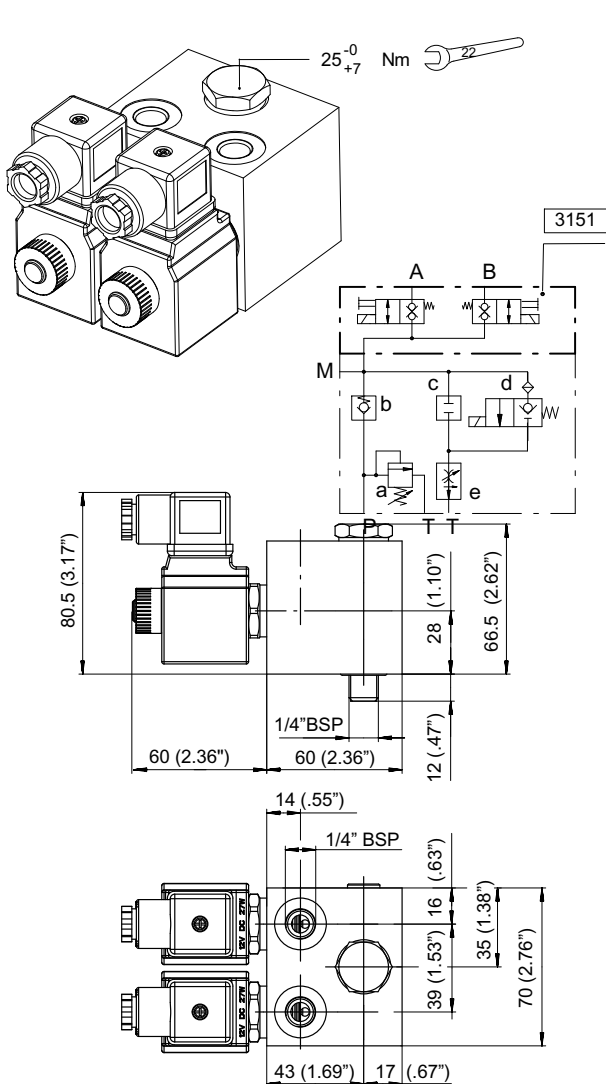
Poppet type

Direct acting - 27 Watt

Flow from 1 to 2

With (SDFE) or without (SDF) manual override

Manual override = push to open



Type	Code
Block + Banjo	200703500240

A.C. supply requires connector with bridge rectifier included

8.5.3 Special block 3152

Pre-arranged for one SDFE817/22-TH solenoid valve.

Valve block able to control and operate two single acting cylinders with the possibility to balance both at the same level operating the solenoid control valve.

Suitable for housing UP100/K1G2* - UP100/K4G2*.

Normally closed

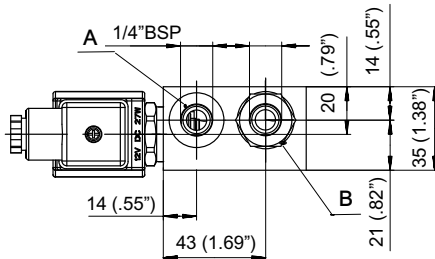
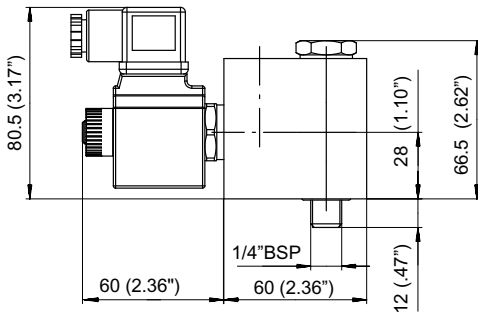
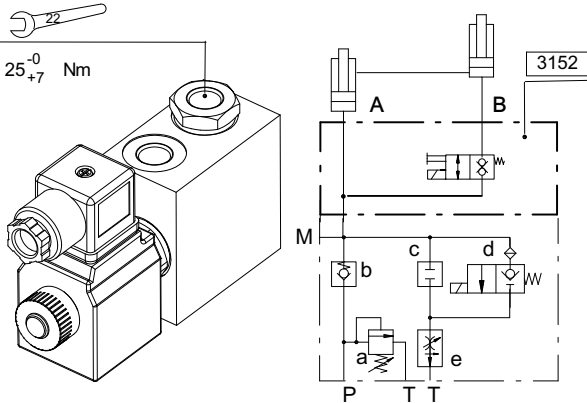
Poppet type

Direct acting - 27 Watt

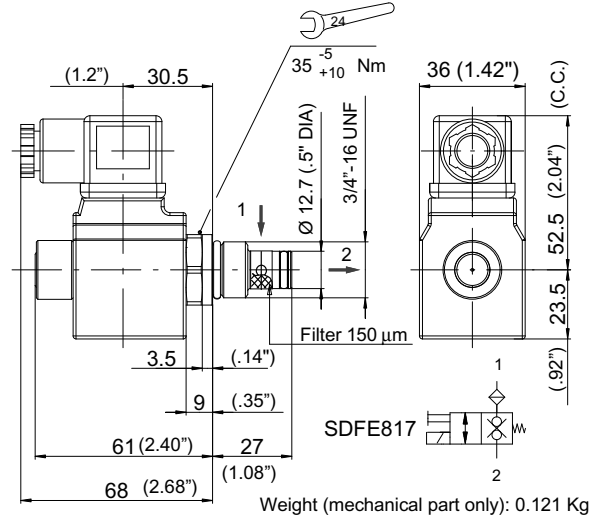
Flow from 1 to 2

With (SDFE) or without (SDF) manual override

Manual override = push to open



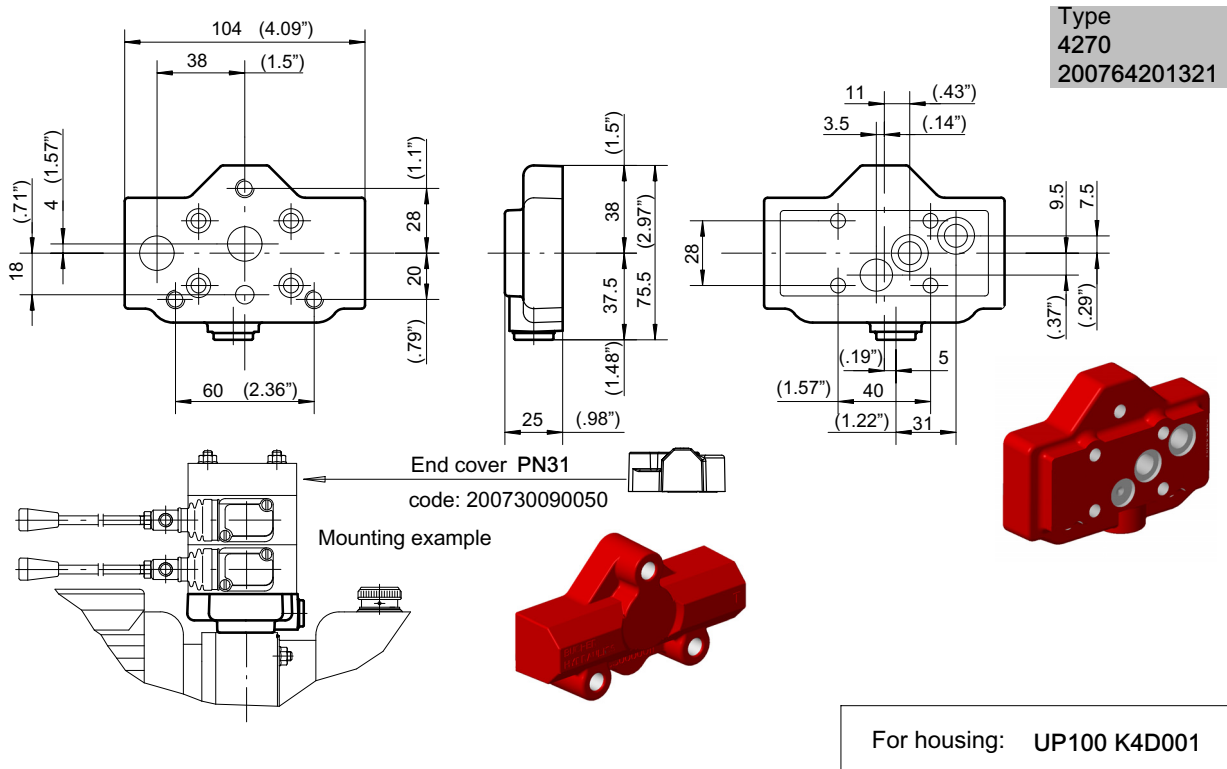
A.C. supply requires connector with bridge rectifier included



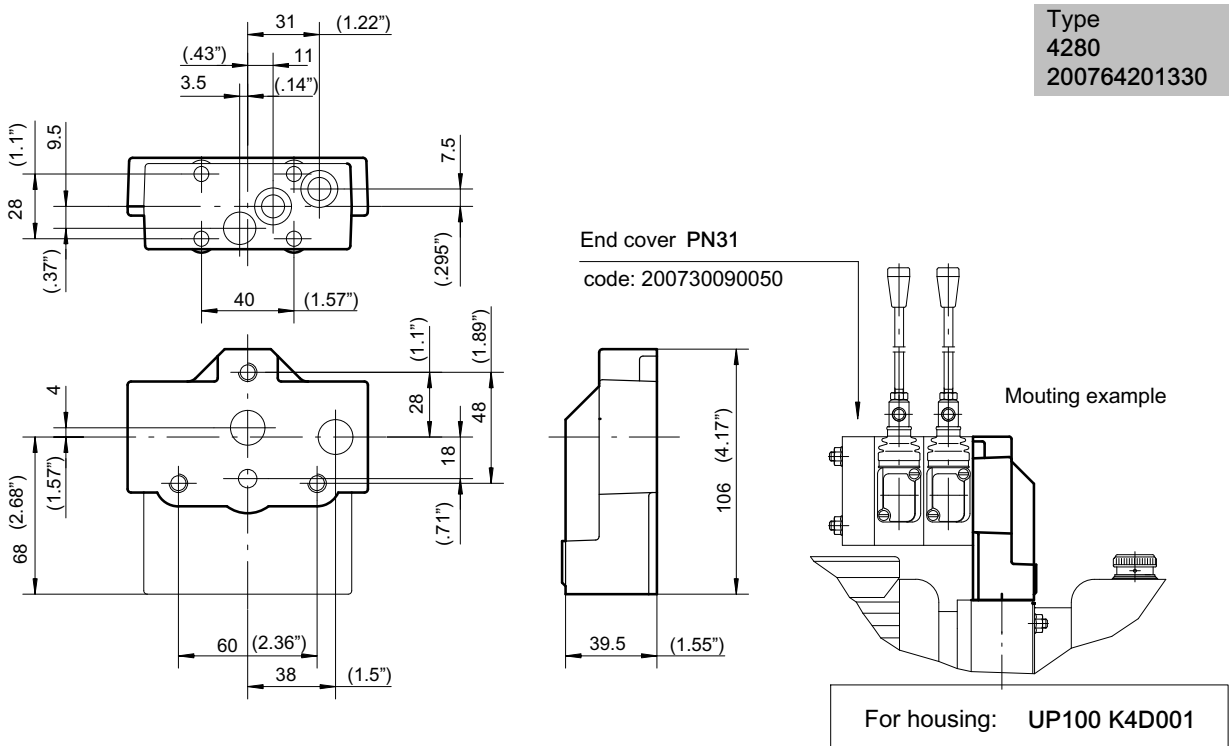
Type	Code
Block + Banjo	200703500281

8.6 Manifolds for HDS11-HDS07 directional control valve

8.6.1 Vertical mounting



8.6.2 Horizontal mounting

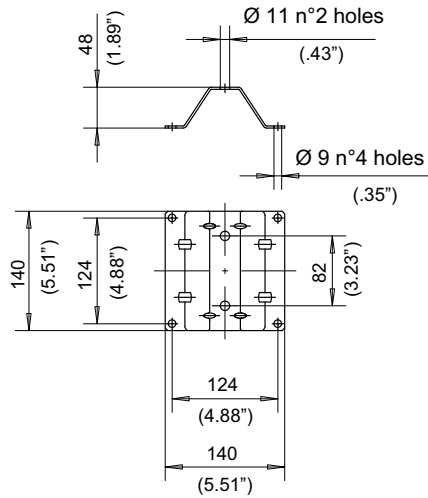


For technical information regarding performance, ordering information and selection, please, refer to the HDS07 and HDS11 section of the Directional control valve catalogue.

9 Components

9.1 Steel plate bracket pressed for UP housing SL01

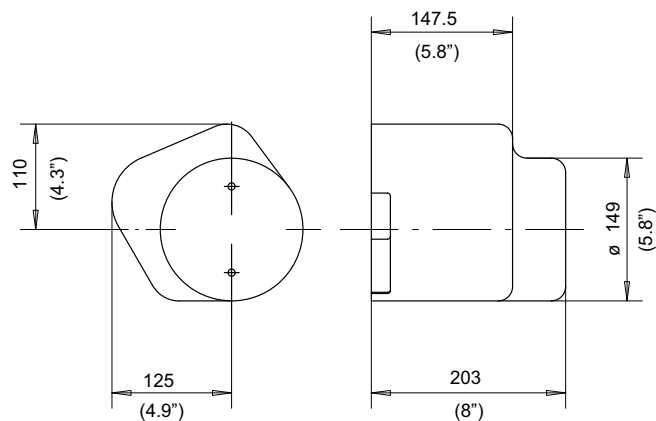
Code
200977400120



9.2 Protective cover PP01 for D.C. motors

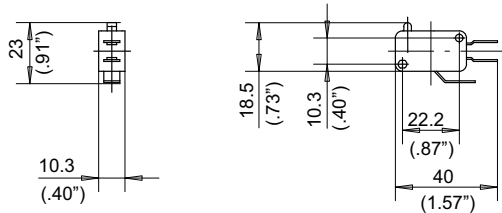
Code
200968800090

Only for motors:
T82K, C134AK, C238AK



9.3 Microswitch

Code
200544124014



Code MS01 (micro only)	200544124014
Complete code MS01-K (micro + fixing kit)	200762500050
Voltage	250 V.
Index protection	IP00
Nominal current	16 A.
Max. current	20 A.
Temperature range	-20/+125°C
Max total stroke	2.6 mm.
Working stroke	1.2 mm.
Mechanical life	2x10 ⁷ cycles
Suitable for	ZR817/**

10 Operation and maintenance

This chapter lists the main guidelines that should be followed to ensure smooth operation and long life service life of the power pack.

10.1 Oil

Use only a mineral based hydraulic oil responding to ISO/DIN 6743/4.

Other types of fluid can use serious damage to the power pack and jeopardize its correct operation.

Recommended viscosity is between 20 and 120 mm²/s.

Contamination levels must be no higher than class 18/15 as prescribed by ISO 4406.

Check that the oil level is correct when filling the tank.

10.2 Starting

Connect the e. motor according paragraph 5.2 and check that the direction of rotation is correct by supplying power for 1-2 seconds only.

For power packs which use pump series AP100 S409 and AP100 S509 the correct rotation is counterclockwise, viewed from the fan side.

Bleed the system of any air, then fill up the oil level in the tank after the initial period of operation.

For systems using solenoid valves with a.c. voltage, check before operating that is fitted the right type of electric connector.

10.3 Maintenance

Check the oil level in the tank on a regular basis.

Following the first few hours operation, inspect the return line filter to verify the rate of pollution, and generally check the level of contaminants in the oil.

Clean the tank inside periodically and replace the oil after every 500-600 hours operation.

In heavy duty conditions or hostile environments, inspections and oil changes should be carried out more often.

Likewise periodically, check the power connections to the electric motor, the solenoid valves and any other electrical accessories (e.g. microswitches, etc.).

In the event that the O-Rings of cartridge valves need to be renewed, use the replacement parts kit specified for each of the valves in the catalogue, positioning the seal and the backup ring as indicated.

Avoid makeshift arrangements using different seals.

10.4 Dealing with possible trouble

This is intended to assist those customers who choose to purchase single sub-assemblies separately and put together their own power packs. Listed below are some of the more commonplace problems that can occur if parts are not assembled correctly.

Trouble observed: Oil leaking from spigot on tank side	
Probable reasons:	Possible remedies:
O-Ring damaged	Inspect and replace O-Ring

Trouble observed: Motor turning but no pressure in circuit	
Probable reasons:	Possible remedies:
Hydraulic circuit wrongly assembled	Inspect position and type of plugs and valves fitted into the cavities
Solenoid valve normally open energized by not correct or lower tension	Check energizing with the correct nominal input voltage.
Solenoid valve normally closed but continuously energized.	Check electrical connections.
Electric motor rotates in wrong direction	Check and modify the electric connection
Pump bearings fitted incorrectly	Check and re-assembling correctly
Pressure relief valve set at not correct valve	Check with a gauge and set to the correct pressure
The pump does not suck oil owing to low oil level in the tank	Check and fill the tank with correct oil level
The drive coupling between pump and e. motor is not correctly assembled	Check and assemble in the correct position

Trouble observed: Cylinder rod extends correctly, but fails to retract when unloading valve is opened	
Probable reasons:	Possible remedies:
Solenoid unloading valve not energized	Check electrical connections
Solenoid unloading valve not energized with nominal input voltage	Check power input and restore nominal voltage.
Solenoid valve has lower performances compared to the circuit requirements. consequently unable to handle flow/pressure.	Verify, and replace with a model giving higher performances.
The solenoid valve is blocked because of dirt in the system	Disassemble and clean
Valve solenoid damaged by overheating	Possible overvoltage. Check rated voltage of solenoid against input voltage. If system is using a.c., make certain the type of the connector is correct.

Trouble observed: Cylinder rod does not keep the position due to internal leakage	
Probable reasons:	Possible remedies:
Dirt in the system	Clean up components and restore system to a suitable level of cleanliness. Check that valve elements and seats are undamaged. Check piston seals for wear.

Trouble observed: Oil leaking on motor side	
Probable reasons:	Possible remedies:
Pump shaft seal damaged during assembling	Check seal, and replace if it is necessary

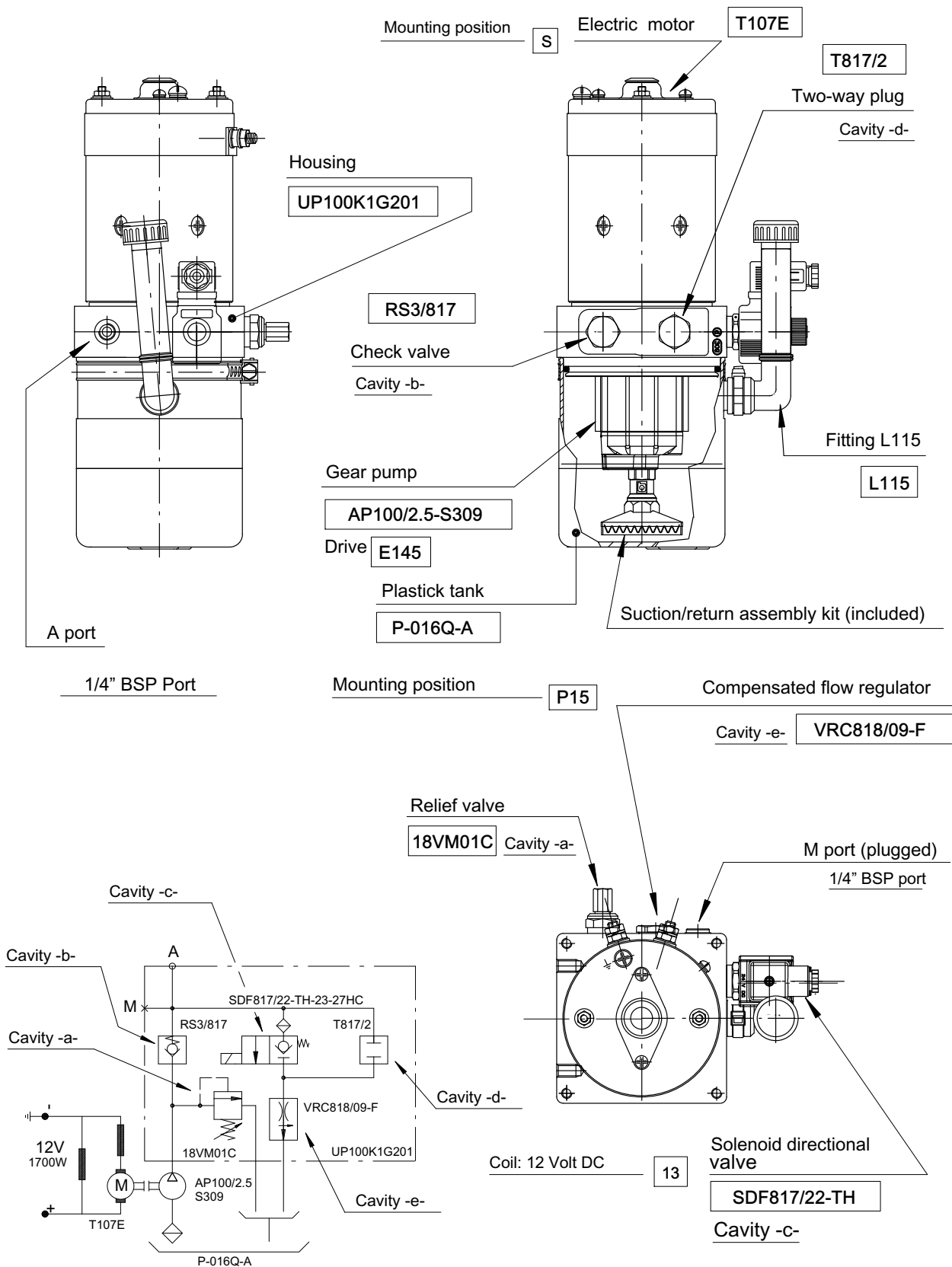
Trouble observed: High noise level	
Probable reasons:	Possible remedies:
Air in the system.	Bleed off any air by loosening a pressure line fitting
Possible damage to pump shaft oil seal damaged during assembly	Check seal, and replace if it is necessary
Drive coupling not fitted correctly	Inspect and assemble correctly
Coupling worn	Inspect and replace if necessary
Pump suction with air inside	Check the oil level in the tank and the connections between filter, suction pipe and pump

Trouble observed: High current consumption of the electric motor	
Probable reasons:	Possible remedies:
Motor incorrectly installed	Check correct mounting position if necessary
Low battery charge	Measure, and recharge if necessary
Pump O-Ring or backup ring not fitted correctly	Check, and if necessary replace O-Ring and backup ring.

Trouble observed: Electric motor continues to run even when switched off	
Probable reasons:	Possible remedies:
Wrong electrical connections	Check, and restore proper connections
Starting relay contacts are fuse together as a result of high current.	Disconnect power input immediately and verify condition of the contacts. Replace starter relay if necessary

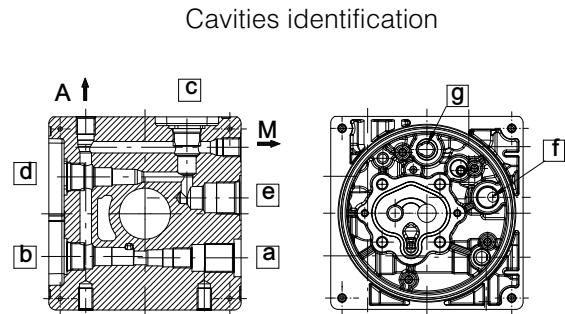
11 Composition of hydraulic power pack ordering code

Assembled power pack example



Example of hydraulic power pack ordering code

1	Type of housing	Vers.		
UP100 / K1G201				
2	Pump	Hi-Lo	Series	
AP100 / 2.5			S309	
3	Tank	Fitting	Pos.	
P-016Q-A	L115	P15		
4	Suction assembly kit	Tank fixing kit		
5	Electric motor	Pos.	Relay	Pos.
T107E	S			
6	Drive			
E145				

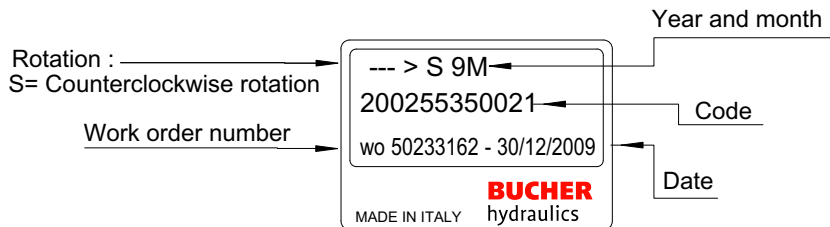


7	Cavity a	Cavity b	Cavity c	
	18VM01C	RS3 / 817	SDF817 / 22 - TH	
	Cavity d	Cavity e	Cavity f	
	T817 / 2	VRC818 / 09 - F		
	Cavity g	Hand lever	Stick lever	Volt
				13

Composition of product code

UP100/K1G201 AP100/2.5S309
P-0160Q-A L115 P15 T107E S E145
a) 18VM01C b) RS3/817
c) SDF817/22-TH-13-27HC
d) T817/2 e) VRC818/09-F

Product identification plate - Example



Manufacturing month	Manufacturing year						
	2017	2018	2019	2020	2021	2022	2023
January	7A	8M	9M	0M	1M	2M	3M
February	7B	8N	9N	0N	1N	2N	3N
March	7C	8P	9P	0P	1P	2P	3P
April	7D	8Q	9Q	0Q	1Q	2Q	3Q
May	7E	8R	9R	0R	1R	2R	3R
June	7F	8S	9S	0S	1S	2S	3S
July	7G	8T	9T	0T	1T	2T	3T
August	7H	8U	9U	0U	1U	2U	3U
September	7I	8V	9V	0V	1V	2V	3V
October	7J	8Z	9Z	0Z	1Z	2Z	3Z
November	7K	8X	9X	0X	1X	2X	3X
December	7L	8Y	9Y	0Y	1Y	2Y	3Y

info.it@bucherhydraulics.com

www.bucherhydraulics.com

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Classification: 440.405.000