Hydronit®

www.hydronit.com

2014
Hydraulic power packs
AC & DC Micro series

sales@hydronit.com · +39 02 320 625 145

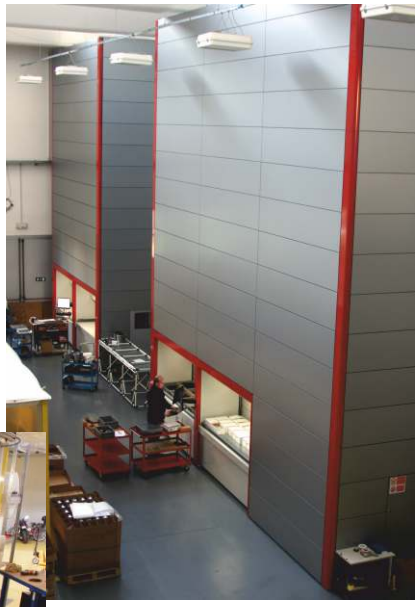
Why choose Hydronit?

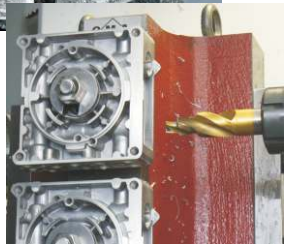
- Complete focus on hydraulic components & modular power pack design, **continuous** research, development and **innovation**
- Organization fully based on processes and **Total Quality Management** principles, certified **ISO 9001:2008** and **ISO 50001:2011**
- Lean and **energy efficient** product design and manufacturing
- **Mass production** and **cost optimization**: hundreds of thousands of Hydronit modular power packs are now reliably running worldwide
- **Flexible marketing policy**: supply of loose hydraulic components and power packs either in kit or fully assembled and tested in accordance with **Machine Directive 2006/42/CE**
- Distributors, associate companies and partners in over 50 countries worldwide

sales@hydronit.com · +39 02 320 625 145

Hydronit - The sustainable factory

- Production is carried out in a building of 13000 m^3 **requiring almost no use of fossil fuels** to operate
- The **hyper insulation of the structure** through the use of materials, mainly natural, such as wood and cork, ensures a consumption of only 7,4 kWh/m^3/year for winter heating and for summer cooling only 3,2 kWh/m^3/year
- A **heat pump** provides high efficiency thermal regulation
- A system of 60 solar panels on the roof of the offices provides 13,8 kW of electrical power that **contributes about 60% of the electricity consumed** by the plant for its own operation
- **Solar thermal panels** provide hot water
- The **automatic warehouses** and the **semi-automatic assembly** line increase efficiency, reduce process paperwork and human errors, thus ensuring compliance with **stringent quality standards** and **repeatable test results**





sales@hydronit.com · +39 02 320 625 145

Continuous innovation

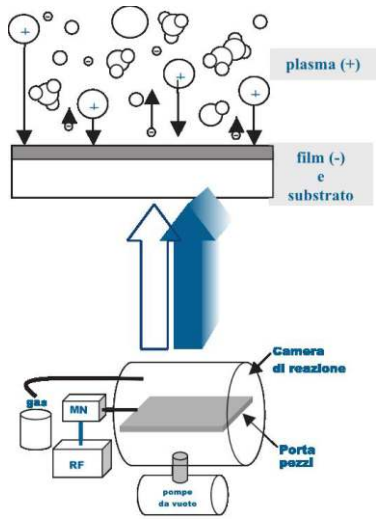
Hydronit Srl, in the pursuit of excellence, have dedicated a large part of their profits to **research and continuous development of the product**, in order to increase the performance, efficiency, durability and reliability over time, and for the **continuous process improvement**, constantly monitoring parameters for over thirty indicators of the efficiency and effectiveness of the organization as a whole.

Nanotechnology surface treatment

Hydronit Srl, in partnership with research institutions and external bodies, co-financed by Lombardia Region, has initiated some years ago a project for the **development of advanced applications of plasma surface treatment of metallic materials**. In short it is the application of **nanotechnology** to hydraulic equipment to improve the performance of our units. We have obtained excellent results in the following fields:

- **improvement of the pressure tightness** of the aluminum die-casting
- **improvement of the characteristics of surface hardness** of the treated components
- a **remarkable increase in the corrosion resistance of the surface**.

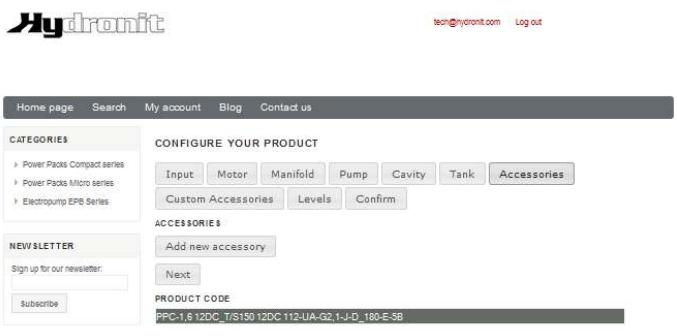
More information is available by contacting our sales department.

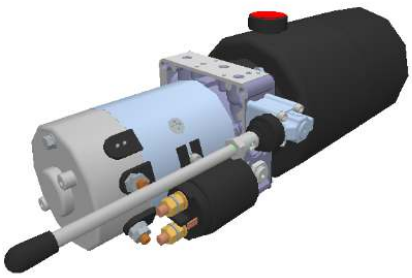


Nanotech treated manifold Standard manifold

Exposure to salt spray > 300 hours

Product Configurator





Hydronit Srl has developed over the years a smart **Product Configurator** which allows the user, from a PC or mobile device web browser:

- to simply and quickly create the **speaking code** of the power pack starting from the customer's specific requirements
- to **limit the possible errors** in the product configuration
- to obtain quickly the unit **description and parts list,** the **hydraulic diagram, instant 3D preview, weight, overall dimensions, BOM, price** and **terms of sale**.

This facilitates a **reduced time-to-market** and provides full information on the power unit to be realized.

The access to the web configurator is offered free of charge to official Hydronit partners.

sales@hydronit.com · +39 02 320 625 145

Hydronit hydraulic range

Three main families: **Power Pack Micro, Power Pack Compact, Electropumps Bull** sharing most core components leading to mass production and stock optimization.
Design, research & development according to **flexibility**, **modularity** and **efficiency** principles.

AC & DC MICRO hydraulic power packs

- Extremely **compact and lightweight**
- Flow: **0,2 ~ 6 l/min**
- Pressure up to **250 bar**
- DC motors up to **2,2 kW**
- AC motors up to **1,8 kW**
- High modularity: single & double acting & reversible circuits
- Main valves **on a single side** in most configurations for enhanced positioning in small machines

AC & DC COMPACT hydraulic power packs

- **Over 10 years** of serial production
- Hundreds of thousands of power packs run worldwide
- Flow: **0,2 ~ 25 l/min**
- **Low pressure drop**
- Pressure up to **300 bar** (or more in special application)
- DC motors up to **4 kW**
- AC motors up to **7,5 kW**
- **High modularity**: single & double acting & reversible circuits
- Ideal choice for hydraulic distributors & assemblers

DC electropumps

- **0,15~ 4 kW, 12V** and **24V DC** motors (same as those used in Compact and Micro power packs)
- Forced ventilation **for heavy duty cycles**
- 0,19 ~ 7,9 cc/rev gear pumps (same as those used in Compact and Micro power packs). Lateral ports pumps are also available.
- **Options**: relief valve, starter switch, thermal protection, foot mounting support

sales@hydronit.com · +39 02 320 625 145

Hydronit®

POWER PACKS MICRO series ordering code

PPM	0,3 24DC_S	MB	KM1,3	JM	DM_280	A24DC	R5	X	X	X	X
Power pack Micro series	Electric motor or mounting kit	Central manifold	Gear pump	Cavity 0	Cavity 1	Cavity 2	Cavity 3	Cavity 4	Cav. 5	Cav. 7	Cav. 8

DC Motors

0,15 12DC	12VDC 150W
0,15 24DC	24VDC 150W
0,3 12DC	12VDC 300W
0,3 24DC	24VDC 300W
0,5 12DC	12VDC 500W
0,5 24DC	24VDC 500W
0,8 12DC	12VDC 800W
0,8 24DC	24VDC 800W
1,6 12DC	12VDC 1600W
2,1 12DC	12VDC 2100W
2,2 24DC	24VDC 2200W

DC Motors Options

_T	thermal switch
_S	starter switch
_MC	plastic cover

AC 3 Phase Motors

N0,37AC 3 4 71	0,37kW S3 3 ph 4 pole
N0,55AC 3 4 71	0,55kW S3 3 ph 4 pole
N0,75AC 3 4 71	0,75kW S3 3 ph 4 pole

AC Single Phase Motors

N0,37AC S4 71	0,37kW S3 1 ph 4 pole
N0,55AC S4 71	0,55kW S3 1 ph 4 pole

AC Motors Mounting Kits

NB14 63	B14 frame 63
NB14 71	B14 frame 71

Central Manifolds

MB	Micro B type with 4 lateral cavities
MR	Micro R type for reversible pump
M4	Micro 4 type for 4 way cartridge valves

Central Manifolds Options

US	SAE06 port for North American market

Gear Pumps

KM0,2	0,26 cc/rev gr0
KM0,4	0,38 cc/rev gr0
KM0,6	0,64 cc/rev gr0
KM0,9	0,88 cc/rev gr0
KM1,3	1,25 cc/rev gr0
KM1,5	1,54 cc/rev gr0

High Pressure Gear Pumps

HM0,1	0,2 cc/rev high P gr0
HM0,2	0,26 cc/rev high P gr0
HM0,4	0,38 cc/rev high P gr0
HM0,6	0,64 cc/rev high P gr0
HM0,8	0,8 cc/rev high P gr0
HM1,2	1,2 cc/rev high P gr0

Reversible Gear Pumps

RM0,3	0,32 cc/rev revers. gr0
RM0,5	0,49 cc/rev revers. gr0
RM0,7	0,64 cc/rev revers. gr0
RM0,9	0,88 cc/rev revers. gr0
RM1,3	1,25 cc/rev revers. gr0
RM1,5	1,54 cc/rev revers. gr0

Cavity 0 Valves

JM	check valve 5/8-18UNF
ML	plug 5/8-18UNF

Cavity 1 Valves

DM_*	relief valve P (*= bar max)
XM	closed plug for relief valve cavity

Cavity 2 Valves

A	NC 2/2 way poppet valve
B	NC 2/2 way poppet valve + emergency
Q	NO 2/2 way poppet valve
C	NO 2/2 way poppet valve + emergency
D	NC 2/2 way double poppet valve + emerg.
E	lever operated 2/2 valve
EM	lever operated 2/2 with microswitch
Z	2 way emergency button
S	flow control valve
T*	proportional flow control valve (*=VDC)
U	hand pump 2cc/stroke
G	closed plug
H	closed plug with 1/4 BSPP exit port
N	open plug with 1/4 BSPP open port
P	plug passing through 1/4 BSPP exit port
L	plug 3/4-16UNF
J	check valve 3/4-16UNF

Cavity 2 Valves (M4 Central Manifold)

4VA11C	4/2 way directional valve
4VA2	4/3 way directional valve , centre P to T
4VB2	4/3 way directional valve, closed centre
4VC2	4/3 way directional valve, H centre
4VE2	4/3 way directional valve, centre A-B to T

Cavity 2 and 3 Valves (MR Central Manifold)

MG	closed plug
JP	check valve 5/8-18UNF poppet type

Cavity 3 Valves

AR	NC 2/2 way poppet valve reverse flow
BR	NC 2/2 way poppet valve+em. reverse flow
CR	NO 2/2 way poppet valve+em. reverse flow
D	NC 2/2 way double poppet valve+emerg.
Z	2 way emergency button
F*	fixed pressure comp. flow control (*=l/min)
R*	pressure comp. flow control (*=l/min)
S	flow control valve
P*	prop. relief valve + emergency (*= bar max)
V*	relief valve (*= bar max)
G	closed plug
H	closed plug with 1/4 BSPP exit port
N	open plug with 1/4 BSPP open port
P	plug passing through 1/4 BSPP exit port
L	plug 3/4-16UNF
J	check valve 3/4-16UNF

Cavity 4 Valves (MR Central Manifold)

DM_*	relief valve P (*= bar max)
XM	closed plug for relief valve cavity

Solenoid Valves Coils

12DC	12V direct current
24DC	24V direct current
24AC	24V alternating current 50 or 60Hz
115AC	115V alternating current 50 or 60Hz
230AC	230V alternating current 50 or 60Hz

Cavity 5 - 7 - 8 valves

1(04)	1 l/min pres. comp. flow cont. ø 12,7
1,5(04)	1,5l/min pres.comp.flow cont. ø 12,7
2(04)	2 l/min pres. comp. flow cont. ø 12,7
3(04)	3 l/min pres. comp. flow cont. ø 12,7
5(04)	5 l/min pres. comp. flow cont. ø 12,7
7(04)	7 l/min pres. comp. flow cont. ø 12,7
10(04)	10l/min pres.comp.flow cont. ø 12,7
13(04)	13l/min pres.comp.flow cont. ø 12,7
17(04)	17l/min pres.comp.flow cont. ø 12,7
22(04)	22l/min pres.comp.flow cont. ø 12,7
1(01)	1 l/min 1/4 BSPP p. comp. flow ctrl
1,5(01)	1,5l/min 1/4 BSPP p. comp. flow ctrl
2(01)	2 l/min 1/4 BSPP p. comp. flow ctrl
3(01)	3 l/min 1/4 BSPP p. comp. flow ctrl
5(01)	5 l/min 1/4 BSPP p. comp. flow ctrl
7(01)	7 l/min 1/4 BSPP p. comp. flow ctrl
10(01)	10l/min 1/4 BSPP p. comp. flow ctrl
13(01)	13l/min 1/4 BSPP p. comp. flow ctrl
17(01)	17l/min 1/4 BSPP p. comp. flow ctrl
22(01)	22l/min 1/4 BSPP p. comp. flow ctrl
P01	1/4 BSPP plug
RETURN-KIT	suction/return line pipe
PP01370	suction/return line pipe
RF01	return line immersed filter
PIL5818	pilot for piloted check valve
PIL5818DIF	pilot for differential cylinders

Standard mounting positioning rules:

- Tank filler cap on P and T ports side
- AC motor electric box on relief valve side
- DC motors terminals and starter switch on cavity 2 side
- For horizontal mounting units, suction filter on mounting foot holes side

Unless specified otherwise, all power units are supplied assembled according to above rules.

Note: this page contains only the most common codes and options.

For the full available range please check all catalogue sections.

1,5T | M60403010 | SD00A2 24DC | E60543003

Tank & mounting style | **External blocks** | **External valves** | **Accessories**

Plastic Tanks

0,4R	0,4l cylindrical plastic
0,7R	0,7l cylindrical plastic
1,2R	1,2l cylindrical plastic
1T	1l square plastic
1,5T	1,5l square plastic
2T	2l square plastic
2,7T	2,7l square plastic
3,5T	3,5l square plastic

Steel Tanks

0,7F	0,7l cylindrical steel
1,2F	1,2l cylindrical steel
1,7H	1,7l cylindrical steel
2,4H	2,4l cylindrical steel

Tanks Options

V	vertical mounting

External Blocks

M60403004	23mm spacer subplate
M60403005	90° rotation manifold
M60403010	NG3 MICRO parallel block lateral ports
M60413001	NG3 MICRO manifold with p.o. check valves
N50403007	adapter PPM-SD01
N50403007DC	adapter PPM-SD02
PM04M	hand pump 4 cc/stroke manifold block
PM09M	hand pump 8,8 cc/stroke manifold block

Blocks Options

/US	SAE06 exit ports for North American market

Solenoid Directional Valves

SD00A11C	NG3 MICRO directional valve 4/2
SD00A2	NG3 MICRO directional valve 4/3 centre P to T
SD00B2	NG3 MICRO directional valve 4/3 closed centre
SD00C2	NG3 MICRO directional valve 4/3 H centre
SD00E2	NG3 MICRO directional valve 4/3 centre A-B to T
SD01A11C	Stackable directional valve 4/2
SD01A2	Stackable directional valve 4/3 P to T
SD01B2	Stackable directional valve 4/3 closed centre
SD01C2	Stackable directional valve 4/3 H centre
SD01E2	Stackable directional valve 4/3 centre A-B to T
SD02C2RP	Stackable dir. valve 4/3 H centre + p.o. check valves
SD02E2RP	Stackable dir. valve 4/3 centre A-B to T + p.o. check v.
SD02A2TP	Stackable dir. valve 4/3 P to T + cavity SAE08
SD02B2TP	Stackable dir. valve 4/3 closed centre + cavity SAE08
SD02C2TP	Stackable dir. valve 4/3 H centre + cavity SAE08
SD02E2TP	Stackable dir. valve 4/3 A-B to T + cavity SAE08

Accessories

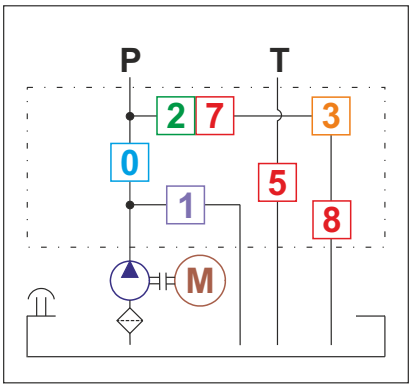
MIR63060EM	pressure gauge 60bar + shut-off
MIR63160EM	pressure gauge 160bar + shut-off
MIR63250EM	pressure gauge 250bar + shut-off
MIR63315EM	pressure gauge 315bar + shut-off
F401050W	pressure switch 5~50bar
F401100W	pressure switch 10~100bar
F401200W	pressure switch 20~200bar
F401400W	pressure switch 50~400bar
P0201	remote 2 button control box
P0202	remote 4 button control box
VPC00	PWM driver for proportional valves
E60543003	foot mounting support
VUR01C	in-line check valve 1/4 BSPP
VUR02C	in-line check valve 3/8 BSPP
VURSAE06C	in-line check valve 9/16-18UNF
STU01	in-line unidirectional flow valve 1/4 BSPP
STU02	in-line unidirectional flow valve 3/8 BSPP
STUSAE06	in-line unidirectional flow valve 9/16-18UNF
STB01	in-line bidirectional flow valve 1/4 BSPP
STB02	in-line bidirectional flow valve 3/8 BSPP
STBSAE06	in-line bidirectional flow valve 9/16-18UNF
BFCSAE0801	In-line mounting SAE08 manifold 1/4 BSPP
BFCSAE0802	In-line mounting SAE08 manifold 3/8 BSPP

Solenoid Directional Valves Coils

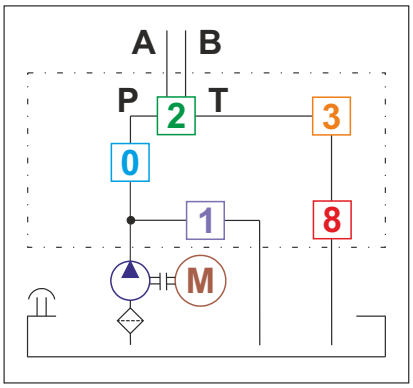
12DC	12V direct current
24DC	24V direct current
24AC	24V alternating current 50 or 60Hz
115AC	115V alternating current 50 or 60Hz
230AC	230V alternating current 50 or 60Hz

Note: not all the voltages are available on some valve codes

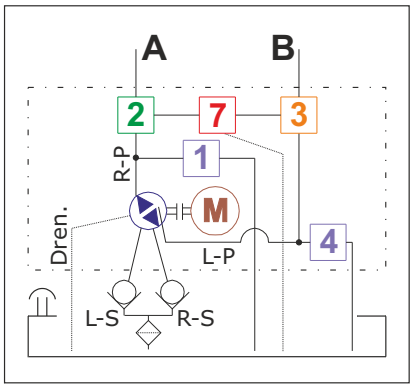
MB central manifold hydraulic scheme



M4 central manifold hydraulic scheme



MR central manifold hydraulic scheme



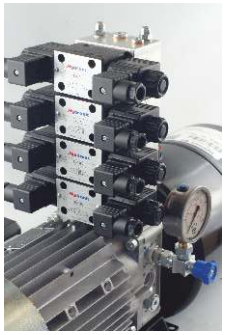
sales@hydronit.com · +39 02 320 625 145

Some typical applications

The **high level of modularity** and **circuit flexibility** of Hydronit hydraulic power packs and electropumps allows you to use them in the most varied applications: in addition to typical applications of **lifting equipment** and hydraulic **vehicles** (dump trucks, tail lifts, ...) and **industrial** (presses, machine tools, hoists, hydraulic brakes, ...), even in the **automotive industry** (drive doors and hood, suspension, campervan ...), **marine** (bridges, cranes, doors, ...), in the **alternative energy** sector, in **agricultural equipment**, in the field of **construction machinery**, in **elevator equipment,** in **explosions proof** environments. Hydronit has also developed **solutions for improvement** to equipment previously available on the market, including the use of **proportional components** and **electronics** for **forklift trucks**, **snow plows**, **brake** and **transmission equipment**, **loading ramps**.

DC applications

AC applications



General application

Install location	Unlimited, paying attention to the correct position of the suction filter
Room temperature	-15 ÷ +50°C
Hydraulic fluid	Fluid for hydraulic use mineral based or synthetic ISO 6743/4 / DIN 51519, viscosity 15 ÷ 100 mm^2/s ISO 3448 (recommended viscosity 22 ÷ 46 mm^2/s)
Fluid temperature	-10° ÷ +70°C
Able contamination	Must be better than class 18/14 ISO 4406
Instructions for the first start	. After connecting the electric motor and the suction tube, check the direction of rotation of the pump by switching on for 1÷2 sec. For standard pumps the direction of motor rotation must be clockwise as viewed on the fan side of the motor. . Flush the oil at atmospheric pressure to remove any impurities and air bubbles from the circuit. . Connect all devices to the system and very gradually bring the circuit up to pressure. . Check the oil level and, if necessary, fill up to the maximum level. Do this with all cylinders retracted. . To ensure correct and lasting operation, check the oil and replace it after the first 100h and every 3000h of work and/or at most every year.
Recommended bolt tightening torques	. M5: 4÷5,5 Nm . M5 for pumps gr. 0,5: 8÷9,5 Nm . M6: 8÷10 Nm . M8: 16÷20 Nm . Valves and plugs 1/4 BSPP: 6÷20 Nm . Valves and plugs 5/8-18 UNF: 15÷25 Nm . Valves and plugs 3/4-16 UNF: 15÷40 Nm . Relief valves M14x1: 25 Nm . Tank plugs 3/8 BSPP: max 10 Nm

AC & DC ELECTRIC MOTORS

Integral AC motors: the engineered solution for compact and optimised power units from 0,25 to 1,8 kW, single or three phase. The AC motors are **directly flanged** on the central manifold for extra compactness.
A **single coupling** can suit all powers. We suggest that you adopt these advanced motors because of their special advantages over standard B14 IEC AC motors and because they are **designed specifically** for use on our micro power packs, offering **higher power density** than market standard motors. These motors are intendend for intermittent use (S3 40%), which is the case for most micro-power pack applications. They can be used in emergency situations continuously at a reduced rated power (about 30% less than S3 nominal power).
Single phase motors should not run in any case without load for long periods to avoid overheating.

B14 IEC standard AC motors: the standard solution easily available on every market from 0,12 to 0,55 kW, single or three phase. These motors are normally procured by the customer itself. Hydronit provides adaptor flanges and double piece coupling for frame size: 63 and 71.

Frame 80 DC motors: with or without thermal protector and running time up to 6 min. Power from 0,15kW up to 0,8kW 12 or 24VDC.
The permanent magnet construction allows their use in reversible units.

Frame 114 DC motors: power up to 2,2kW 24VDC for high performance.
All motors have thermal protector switch as standard.

Are AC motors compliant with the European Union Minimum Energy Performance Standards?
Hydronit AC motors are manufactured in Italy with the best technologies nowadays available and are specifically designed for mini power pack duties, which are typically intermittent. Hydronit motors have higher power density, lower weight, lower cost, compared to standard IE2 motors on the market. Due to the specific field of application, Hydronit motors are not included in the requirements of the above mentioned standard, since they are specially and solely manufactured for mini power pack intermittent duties. For continuous duty applications IE2 motors (IEC 60034-30) must be applied. Ask our sales office.

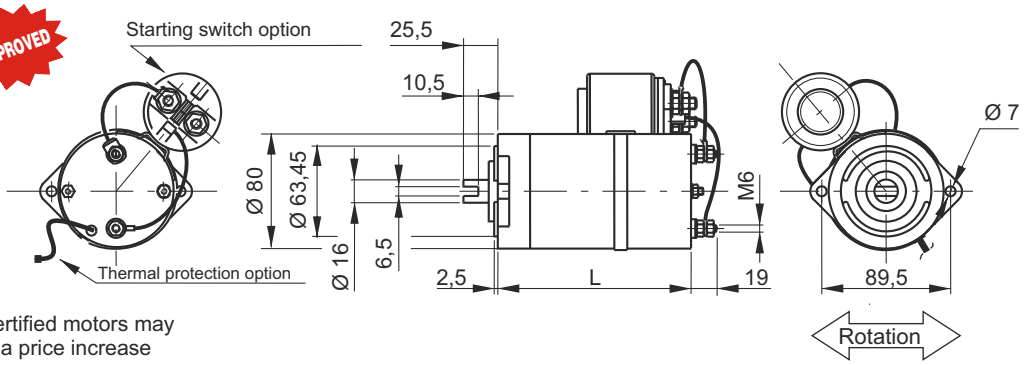
Are there special requirements to mount IEC B14 motors?
No special tooling is required. Please strictly follow motor side coupling mounting dimension tolerance as per the relevant drawings. Failure to do so may cause malfunction of the power pack and even breakage of the coupling and pump.

Can I start single phase AC motors under load?
All single phase motors have a reduced starting torque due to their intrinsic design. Normally this ranges around 30~40% of the nominal torque at full power output. When designing circuits where a single phase motor must start under load, correct sizing must be done and a field test must be performed first. High starting torque motors are available on request to overcome these issues. Please ask our technical office.

How do I dimension a DC motor?
These motors are normally for intermittent duty. It is important to know required flow in l/min, working pressure in bar and the duty cycle. The A040 table instructions on the following pages allow a proper motor/pump combination selection.

SECTION A

INTEGRAL DC MOTORS Ø80



Permanent magnets
Protection degree: IP54
Insulation class: F
Weight 300W/500W/800W: 2,6 kg (without starting switch)
Weight 150W: 2 kg (without starting switch)

UL certified motors may have a price increase

Code

Description	Assembly code	Spare part code	Nominal duty cycle	Nominal speed	Nominal current	L
150W 12V DC + thermal protection	**0,15 12DC_T**	**M46C1ST01**	S2: 20 min S3: 30% ED	1200 rpm	28 A	108 mm
150W 24V DC + thermal protection	**0,15 24DC_T**	**M46C2ST01**	S2: 20 min S3: 30% ED	1650 rpm	12 A	108 mm
300W 12V DC + thermal protection	**0,3 12DC_T**	**M46C1ST03**	S2: 9 min S3: 18% ED	1800 rpm	39 A	137 mm
300W 24V DC + thermal protection	**0,3 24DC_T**	**M46C2ST03**	S2: 9 min S3: 18% ED	1800 rpm	20 A	137 mm
500W 12V DC 500W 12V DC + thermal protection	**0,5 12DC** **0,5 12DC_T**	**M46C1S005** **M46C1ST05**	S2: 5 min S3: 15% ED	2400 rpm	68 A	137 mm
500W 24V DC 500W 24V DC + thermal protection	**0,5 24DC** **0,5 24DC_T**	**M46C2S005** **M46C2ST05**	S2: 5 min S3: 15% ED	2500 rpm	31 A	137 mm
800W 12V DC 800W 12V DC + thermal protection	**0,8 12DC** **0,8 12DC_T**	**M46C1S008** **M46C1ST08**	S2: 3 min S3: 10% ED	2800 rpm	119 A	137 mm
800W 24V DC 800W 24V DC + thermal protection	**0,8 24DC** **0,8 24DC_T**	**M46C2S008** **M46C2ST08**	S2: 3 min S3: 10% ED	3100 rpm	52 A	137 mm

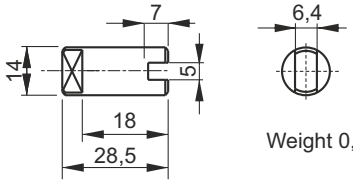
Options & coupling

Description	Assembly code	Spare part code
12V DC 150 Amp start switch + mounting kit	**S100 12DC 80**	**M47RC0001+M47SK0801**
24V DC 150 Amp start switch + mounting kit	**S100 24DC 80**	**M47RC0002+M47SK0801**
12VDC 100 Amp start switch (reversible)	**R100 12DC***	**M47NB0001**
24VDC 100 Amp start switch (reversible)	**R100 24DC***	**M47NB0002**
Remote wired control with 2 buttons and 3m cable	**P0201** (single acting)	
Remote wired control with 4 buttons and 3m cable	**P0202** (double acting)	
Coupling for Ø 80 DC motors and pump group 0	**E36200003**	

Notes: the starting switch mounting kit is provided when specifying the **/S150** as motor option in PPM assembly code. When ordering spare starting switches, it must be ordered separately (code:M47SK0801)

The coupling is already included when specifying the motor in PPM assembly code. It is to be indicated only when ordering PPM with no motor but with coupling.

Coupling E36200003



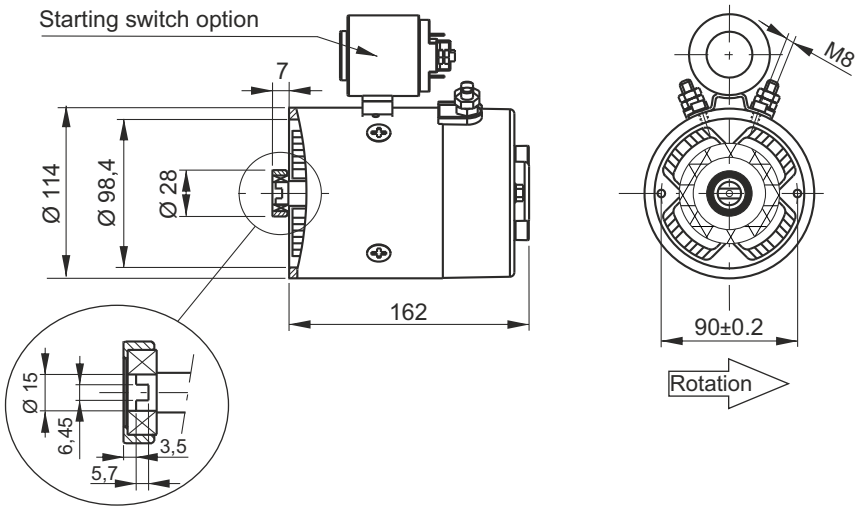
Weight 0,063 kg

* The reversible switch is not designed to be mounted on the motor and should be fixed on the machine frame.

INTEGRAL DC MOTORS Ø114

Compound wound
Protection degree: IP54
Insulation class: F
Weight: 7,05 kg (without starter)

UL certified motors may have
a price increase.



Code

Description	Assembly code	Spare part code	Nominal duty cycle	Nominal speed	Nominal current
1600W 12V DC + thermal protection	**1,6 12DC_T**	**M46C1ST16**	S2: 3 min S3: 10% ED	2800 rpm	210 A
2100W 12V DC + thermal protection	**2,1 12DC_T**	**M46C1ST21**	S2: 2,5 min S3: 10% ED	2400 rpm	300 A
2200W 24V DC + thermal protection	**2,2 24DC_T**	**M46C2ST22**	S2: 3,5 min S3: 15% ED	2400 rpm	130 A

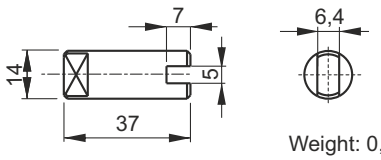
Options & coupling

Description	Assembly code	Spare part code
12V DC 150 Amp start switch + mounting kit	**S150 12DC 112**	**M47SC0001 + M47SK1121**
24V DC 150 Amp start switch + mounting kit	**S150 24DC 112**	**M47SC0002 + M47SK1121**
DC motor plastic cover	**MC**	**F16000001**
Coupling for Ø114 motors and gr.0 pump	**E36200002**	
Remote wired control with 2 buttons and 3m cable	**P0201** (single/double acting)	
Remote wired control with 4 buttons and 3m cable	**P0202** (2 x double acting)	

Notes: the starting switch mounting kit is provided when specifying the **/S150** as motor option in PPM assembly code.
When ordering spare starting switches, it must be ordered separately.

The coupling is already included when specifying the motor in PPM assembly code.
It is to be indicated only when ordering PPM with no motor but with coupling.

Coupling E36200002B



Weight: 0,041 kg

DC MOTOR OPTIONS

Starting relays
for motors diameter Ø80 and Ø114
Weight: 0,3kg (100A), 0,6 kg (150A)
Protection degree: IP54
Max current drawn by the solenoid: 3,6A 12V - 2,0A 24V

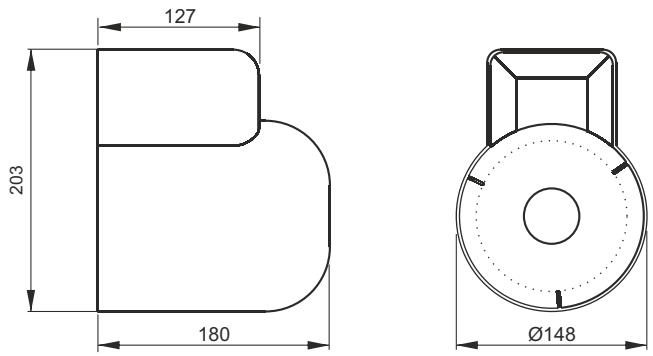
Nominal current	Peak Current (5s)	Spare part code
100A	200A	**M47RC0001 (12V DC)** **M47RC0002 (24V DC)**
150A	300A	**M47SC0001 (12V DC)** **M47SC0002 (24V DC)**

Starting relay (reversible) 100A
for reversible motors and pumps
Weight: 0,50 kg
Protection degree: IP65
Nominal current: 100A (S3 25%)
Peak current (40ms): 400A
Current drawn by the solenoid: 1A 12V - 0,5A 24V

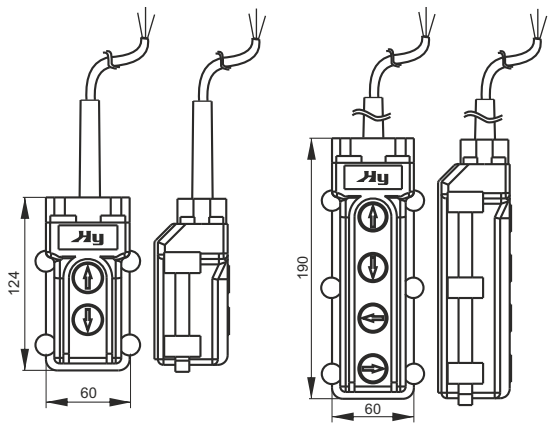
Spare part code
M47NB0001 (12V DC) **M47NB0002 (24V DC)**

Plastic cover for DC motors Ø 114
Weight: 0,27 kg

Weight: 0,60 kg
Protection degree: IP65



Assembly code	Spare part code
MC	**F16000001**

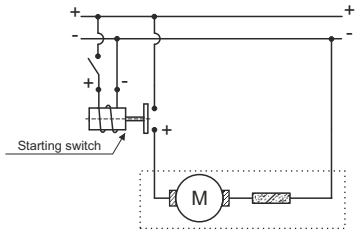


Description	Spare part code
Remote wired control with 2 buttons single/double acting	**P0201**
Remote wired control with 4 buttons double acting	**P0202**

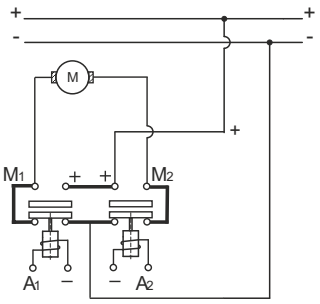
ELECTRIC CONNECTION SCHEMES AND DC MOTOR CHOICE

Electrical connection scheme

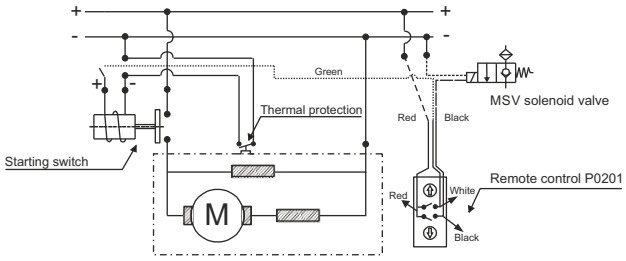
M47SC000* and M47ZC000*



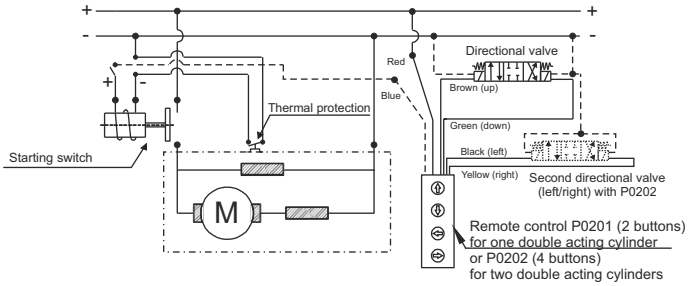
M47NB000*



Single acting cylinder



Double acting cylinder



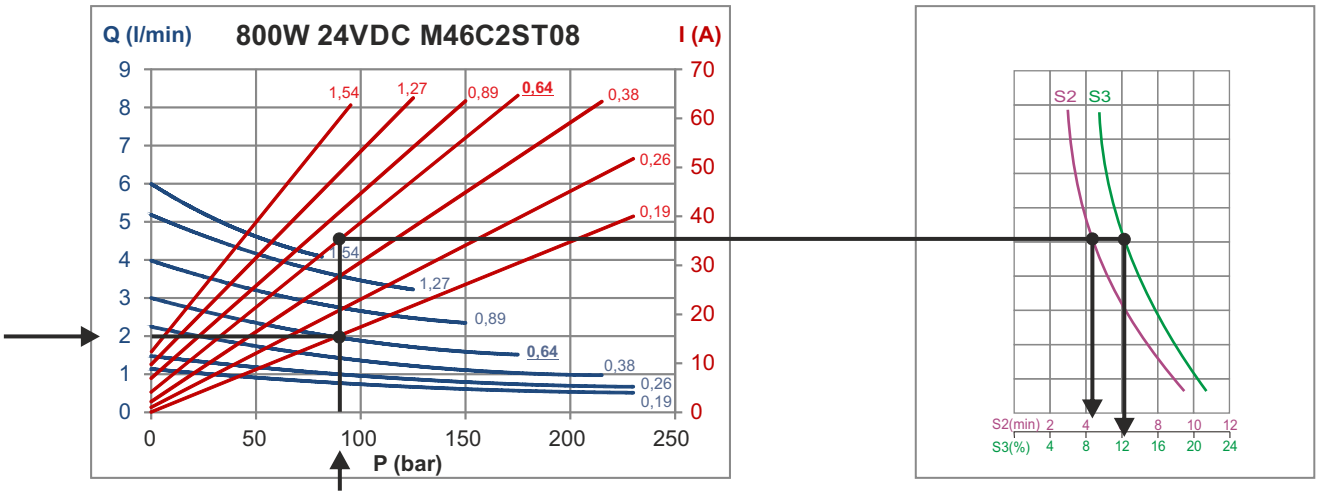
DC motor choice

Once required pressure, flow and available voltage (12 or 24V DC) are known, you can select the motor by checking on the relevant diagram if a pump displacement is available at the intersection of pressure and flow values. On the relevant "I" curve you obtain the absorbed current. When the intersection point is not exactly on a pump curve, choose the closest smaller pump. On the right hand diagram, from the current value, you can easily obtain the maximum allowed S2 (min) and S3 (%) values. S2 gives the allowable motor continuous running time in minutes. S3 gives the allowable running time in % of the total cycle. If the obtained S2 and S3 values are not enough for the required duty cycle, choose a higher power or heavier duty motor and repeat the calculation on the new motor curves.

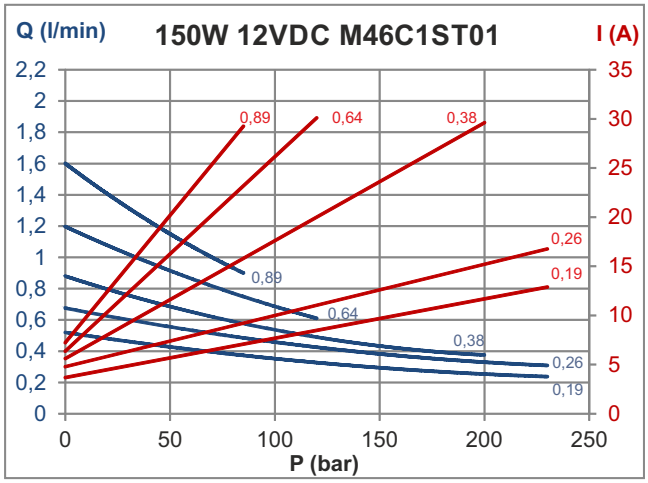
Example:

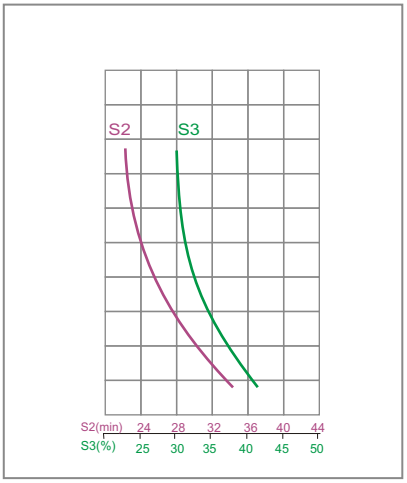
For our application we have following data:
flow = 2 l/min, max pressure = 90bar, not clearly defined duty cycle.

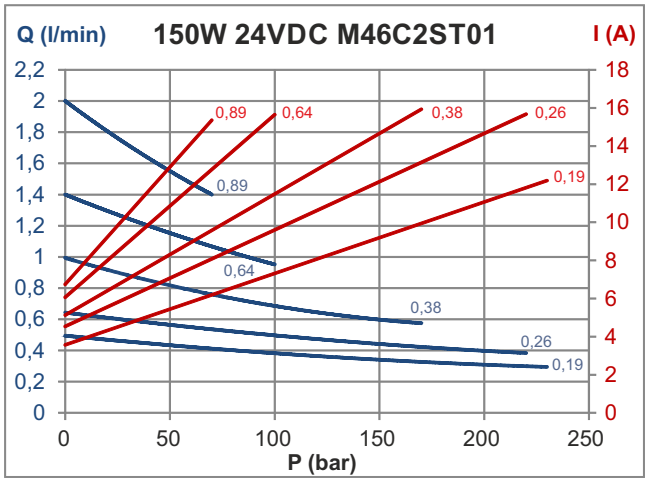
- We check on the DC motor diagram we believe is correct to see if there is a pump available.
- We choose the curve for the 0,64 cm^3/rev pump. On the corresponding "I" curve we read 36 A absorbed current.
- In these conditions on the S2 / S3 diagram we read that the DC motor can work for maximum 4 min (S2), that is 12% (S3) of the total cycle, i.e. after 4 min working, the motor should cool down for at least 29 min.
- The total cycle time is calculated adding the working time and the idle time (12% working time plus 88% idle time), in this case 33 min. If this duty cycle is not adequate for our application, we must choose a higher power or higher duty DC motor and check the relevant diagram again.

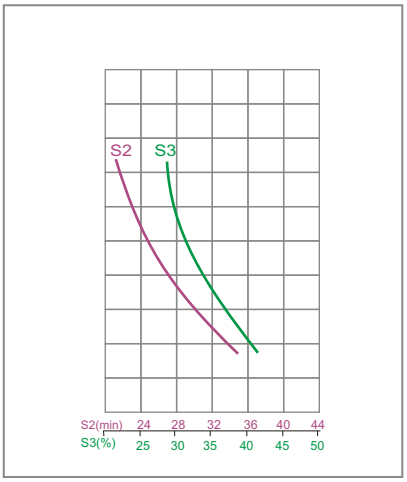


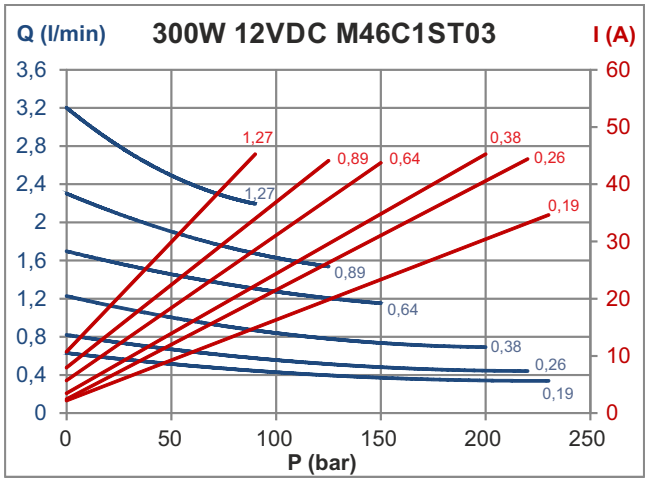
DC MOTOR Ø80 DIAGRAMS

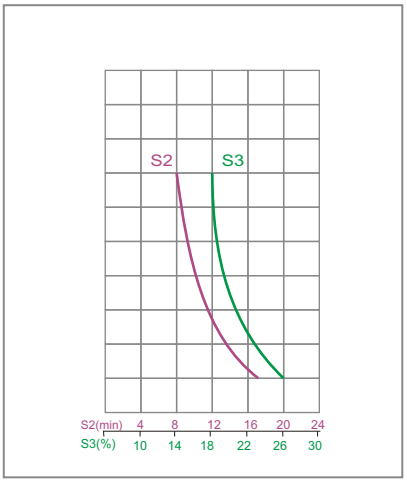






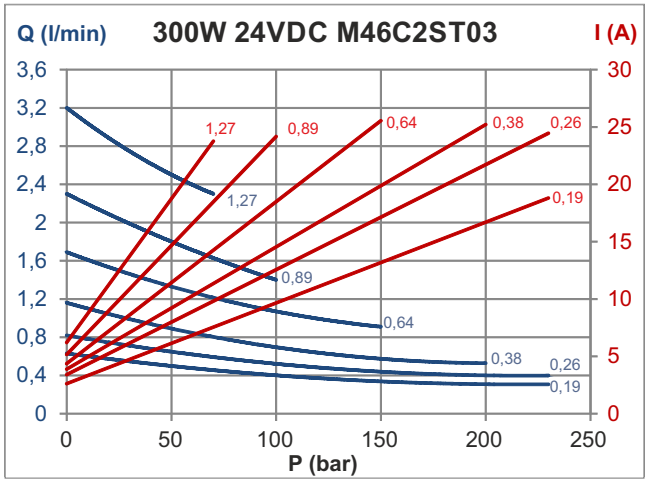


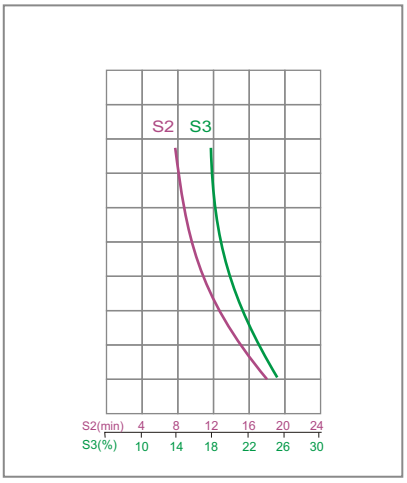


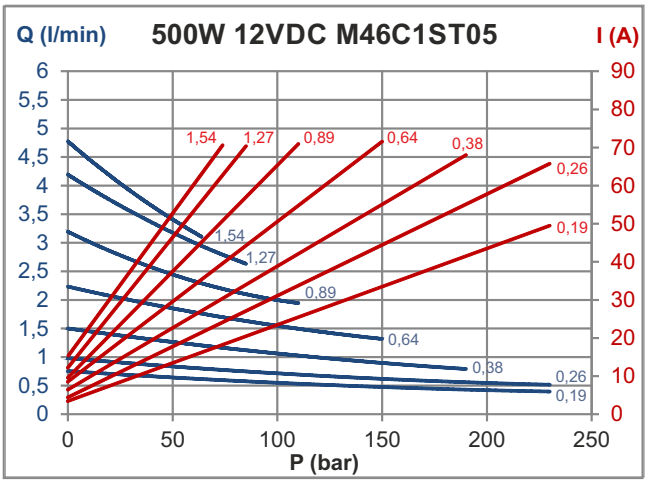


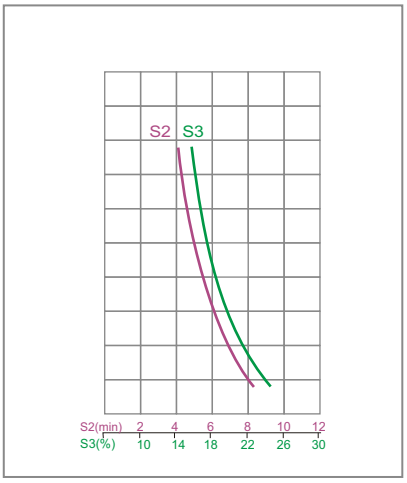
Tests made with rectified current supplied at nominal motor voltage (measured at the motor connection terminals) and oil ISO VG46 at 40°C

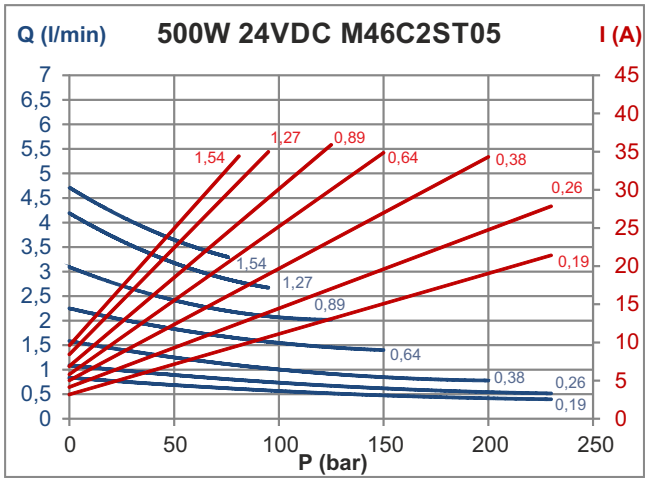
DC MOTOR Ø80 DIAGRAMS

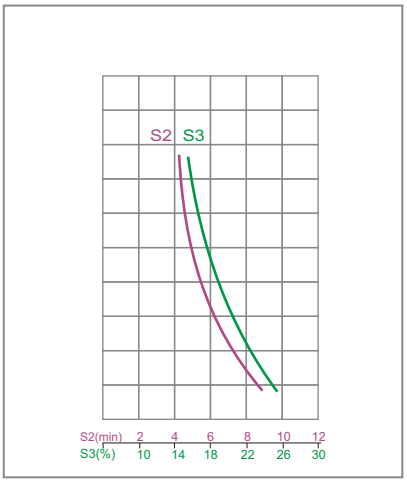








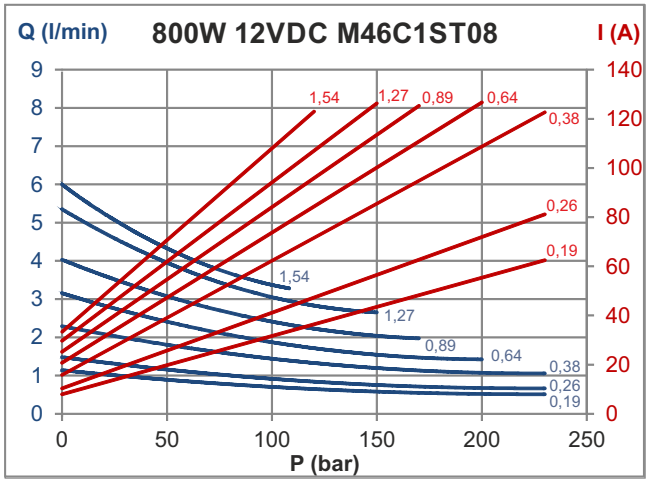


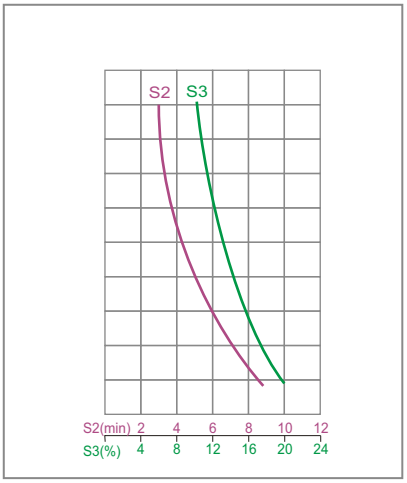


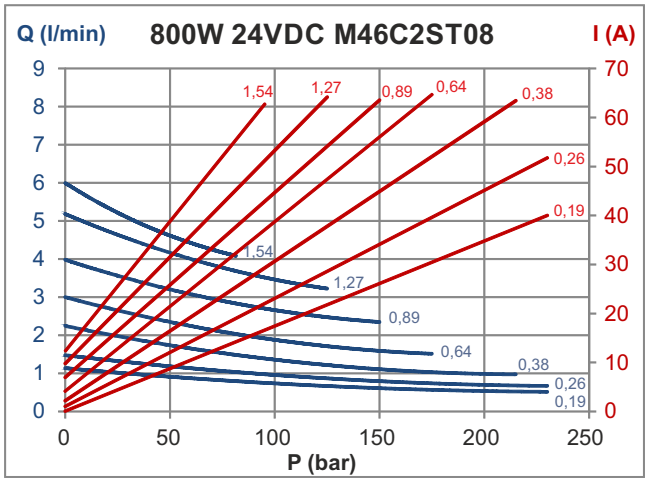
Tests made with rectified current supplied at nominal motor voltage (measured at the motor connection terminals) and oil ISO VG46 at 40°C

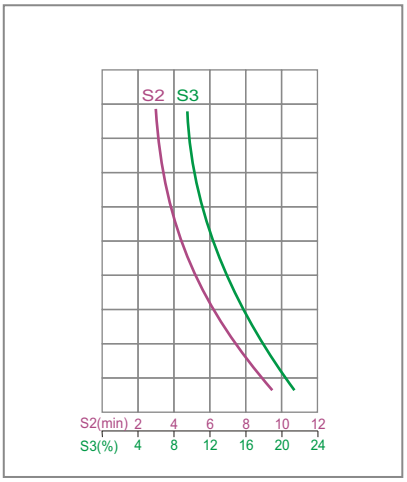
SECTION A

DC MOTOR Ø80 DIAGRAMS



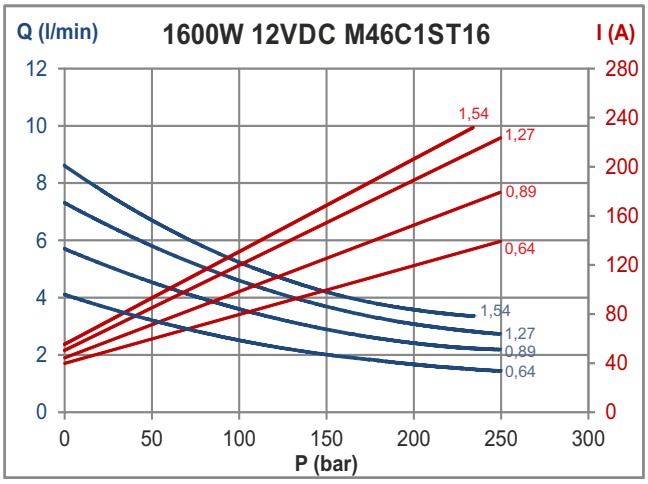


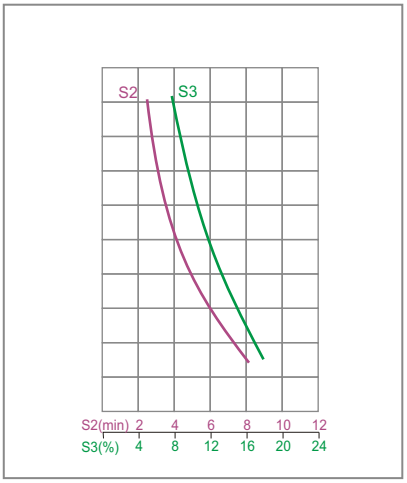


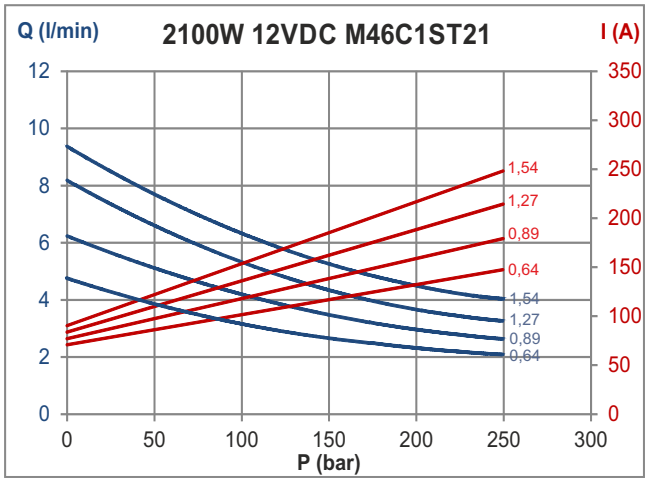


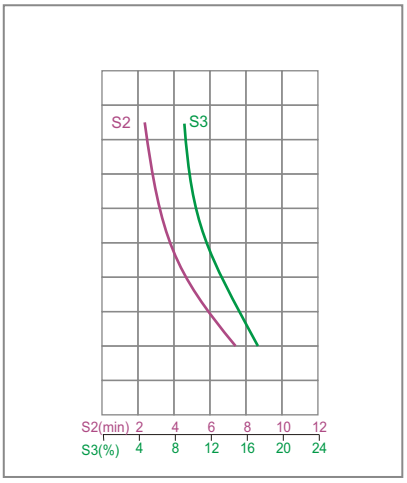
Tests made with rectified current supplied at nominal motor voltage (measured at the motor connection terminals) and oil ISO VG46 at 40°C

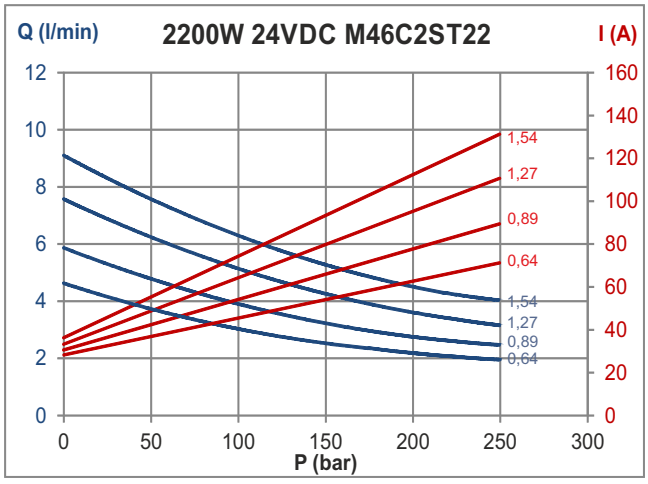
DC MOTOR Ø114 DIAGRAMS

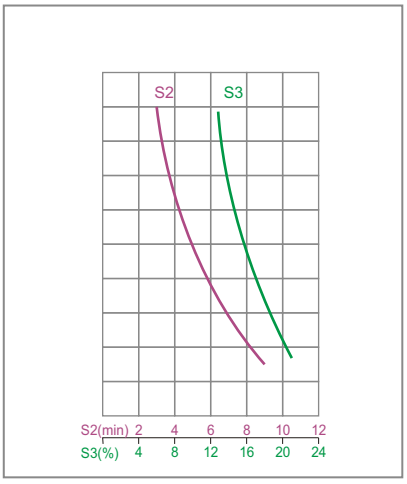












Tests made with rectified current supplied at nominal motor voltage (measured at the motor connection terminals) and oil ISO VG46 at 40°C

SECTION A

INTEGRAL AC MOTORS

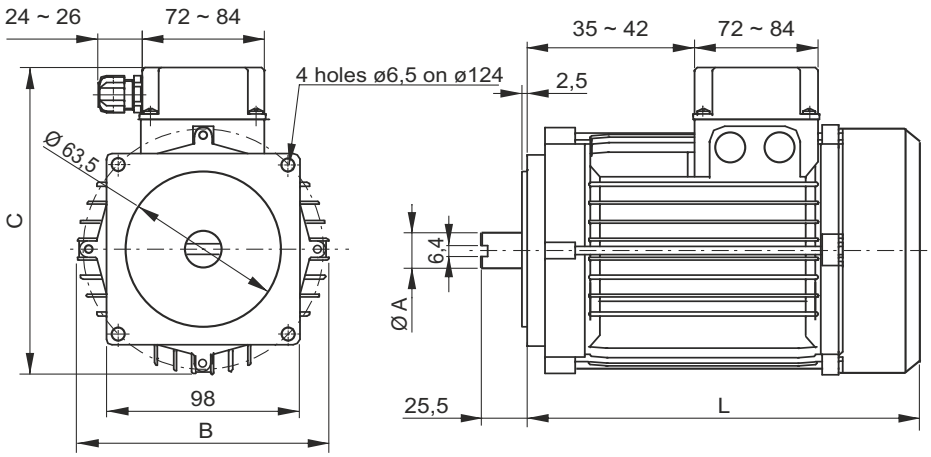
IMPROVED

Integral motors: these are motors specifically engineered and manufactured for our mini power packs, featuring high power density and direct connection to the PPM.
They are available in single phase or three phase execution, in frame 71 with square flange and tang drive shaft. A single coupling fits all dimensions.

Other powers and/or special designs are available on request. Standard motors are for intermittent use: S3 40% is a typical work cycle consisting of up to six cycles (on-off) in one hour with the motor ON and OFF for 4 min to 6 min. These motors can be used in emergency situations even in continuous use at a reduced power (30% less than the nominal value S3).

Drawings show typical three phase motors.
Single phase motors have a larger wiring box which also contains the capacitor(s) or can have an external capacitor(s).

Protection degree:IP54
Insulation class: F
Type of duty: S3= intermittent use



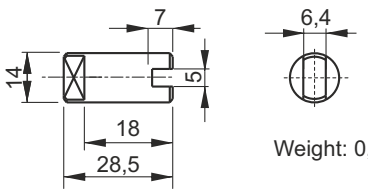
PPM motor assembly code

N	**AC integral motor**
0,75	**Maximum Power [kW]**
AC	**Alternate current**
3	**Fasi: 3** = three phase **S** = single phase
4	**Poli: 4** = four poles **2** = two poles
71	**Cassa**

See a table of available codes on next page

A single coupling will fit all motor frame sizes. This is the same coupling (pump side) included in the B14 motor mounting kit. The coupling is already included when specifying an integral AC motor in the PPM assembly code. When ordering spare motors, the coupling is not included and must be ordered separately.

Coupling code
E36200003



Weight: 0,063 kg

INTEGRAL AC MOTORS

Three-phase 4 poles (~1450 rpm at 50Hz)

Frame size	Maximum Power (S3 40%)	Assembly code	Spare motor code	Ø A	B	C	L	Weight kg
71	0,37kW (0,5HP)	**N0,37AC 34 71**	**N037AC341S3**	15	138	180	210	5,5
	0,55kW (0,75HP)	**N0,55AC 34 71**	**N055AC341S3**	15	138	180	210	5,5
	0,75kW (1HP)	**N0,75AC 34 71**	**N075AC341S3**	15	138	180	210	5,5

Three-phase 2 poles (~2900 rpm at 50Hz)

Frame size	Maximum Power (S3 40%)	Assembly code	Spare motor code	Ø A	B	C	L	Weight kg
71	0,55kW (0,75HP)	**N0,55AC 32 71**	**N055AC321S3**	15	138	180	210	5
	0,75kW (1HP)	**N0,75AC 32 71**	**N075AC321S3**	15	138	180	210	5

Single-phase 4 poles (~1450 rpm at 50Hz)

Frame size	Maximum Power (S3 40%)	Assembly code	Spare motor code	Ø A	B	C	L	Weight kg
71	0,37kW (0,5HP)	**N0,37AC S4 71**	**N037ACS41S3**	15	138	180	210	6,5
	0,55kW (0,75HP)	**N0,55AC S4 71**	**N055ACS41S3**	15	138	180	210	7,2

Single-phase 2 poles (~2900 rpm at 50Hz)

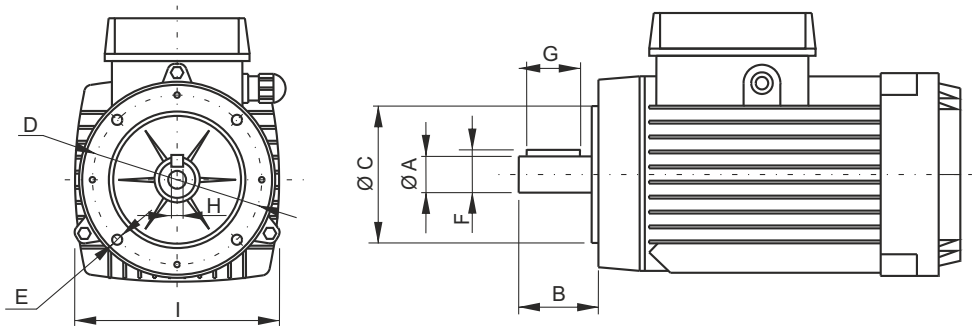
Frame size	Maximum Power (S3 40%)	Assembly code	Spare motor code	Ø A	B	C	L	Weight kg
71	0,55kW (0,75HP)	**N0,55AC S2 71**	**N055ACS21S3**	15	138	180	210	6
	0,75kW (1HP)	**N0,75AC S2 71**	**N075ACS21S3**	15	138	180	210	6,5

B14 IEC AC MOTORS

B14 IEC motors: for market compatibility, any IEC standard B14 AC motor with frame 63 and 71 can be mounted. In this case two-piece couplings and additional adaptor flanges as per tables on pages A120 and A130 must be mounted.

Motor overall dimensions are not indicated since they can vary substantially depending on the motor brand selected.

CE



Main dimensions for B14 IEC standard motors

Frame size	Typical power range	ØA	B	ØC	D	E	F	G	H	Mounting kit
63	0,12 ~ 0,25 kW 0,16 ~ 0,35 HP	11 j6	23	60	75	M5	12,5	18	4	**NB14 63**
71	0,25 ~ 0,37 kW 0,37 ~ 5 HP	14 j6	30	70	85	M6	16	25	5	**NB14 71**

PPM B14 motor assembly code

B14	**Type**
025	**Power [kW]**
AC	**Alternate current**
3	**Phase: 3** = three phase **S** = single phase
4	**Poles: 4** = four poles **2** = two poles
0	**Frame size: 0** = 63 **1** = 71
-	**Duty factor: -** = ED 100% (S1) **S3** = intermittent duty

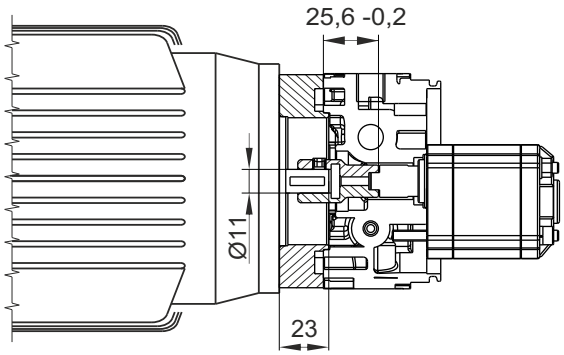
Mounting kit spare parts

The B14 mounting kits are made of:
- a semi-coupling E3610000M on pump shaft side, that is the same used on AC integral motors.
- a semi-coupling on motor shaft side, which is different for each frame size,
- an adaptor flange to suit the central manifold, which is also different for each frame size.

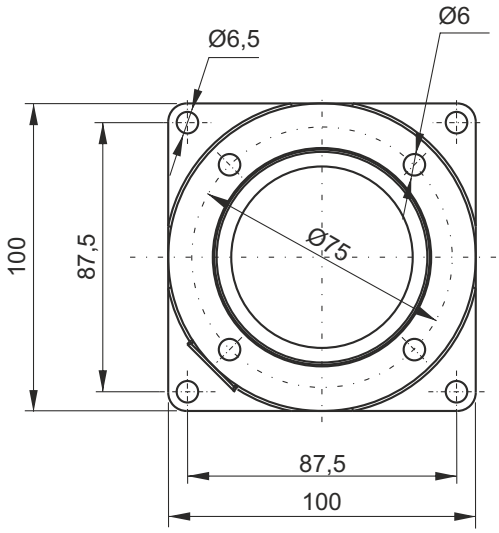
The mounting kit is already included when specifying a B14 AC motor in PPM assembly code.
When ordering spare motors, the relevant mounting kit is not included and must be ordered separately.

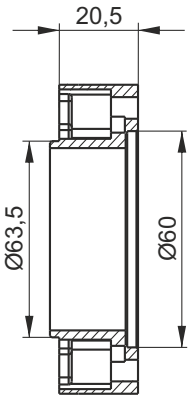
MOUNTING KIT FOR FRAME 63 B14 IEC MOTORS

Kit weight: 0,18 Kg



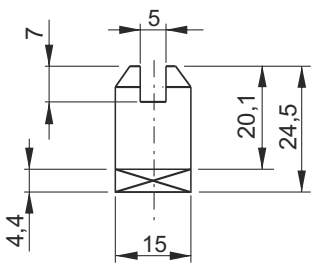
Adaptor flange



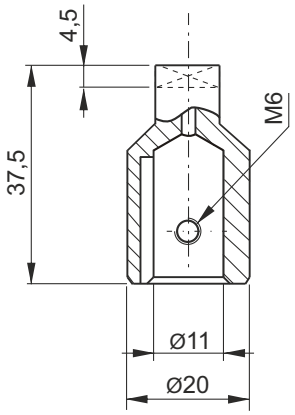


Coupling

Pump side **E36100000M**



Motor side **M36100011**



Description	Assembly code*	Spare part code
B14 63 motor side semi-coupling	NB14 63	**M36100011**
B14 pump side semi-coupling		**E36100000M**
B14 63 adaptor flange		**F25030002**

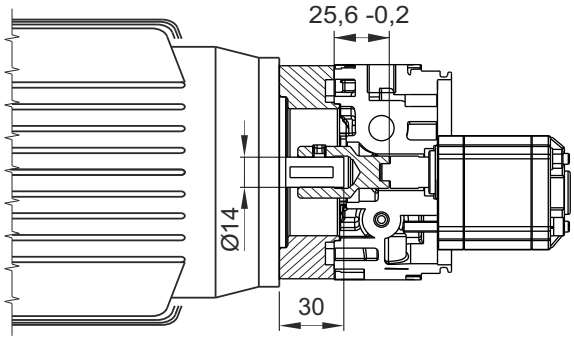
* Note: the coupling + flange kit is already included when specifying a B14 motor in PPM assembly code. NB1463 code to be indicated only when ordering PPM with no motor but with coupling + flange kit.

Attention! When assembling B14 IEC motors with NB14 flange + couplings kit, please respect positioning tolerances as shown in the drawing at the top of this page. Failure to do so can cause malfunctioning or component failure.

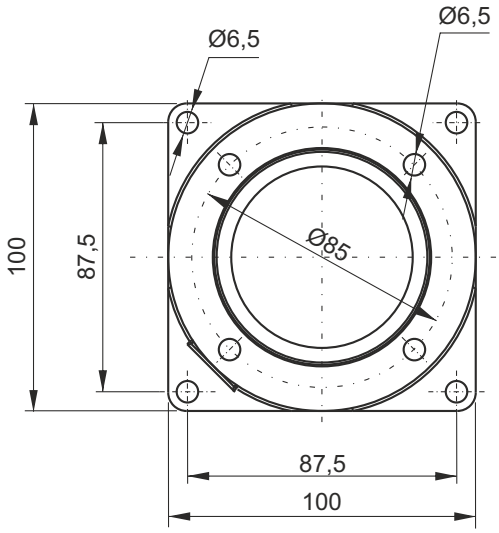
SECTION A

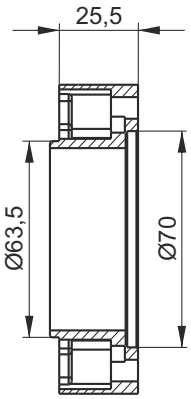
MOUNTING KIT FOR FRAME 71 B14 IEC MOTORS

Kit weight: 0,18 Kg



Adaptor flange



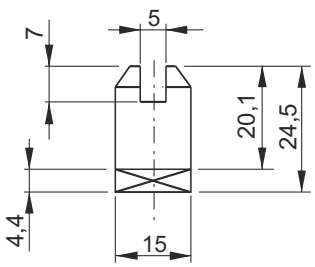


Description	Assembly code*	Spare part code
B14 71 motor side semi-coupling	NB14 71	E36100001
B14 pump side semi-coupling		E36100000M
B14 71 adaptor flange		F25030003

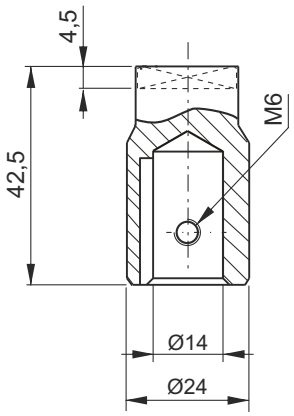
* Note: the coupling + flange kit is already included when specifying a B14 motor in PPM assembly code. NB1471 code to be indicated only when ordering PPM with no motor but with coupling + flange kit.

Couplings

Pump side **E36100000M**



Motor side **E36100001**



Attention! When assembling B14 IEC motors with NB14 flange + couplings kit, please respect positioning tolerances as shown in the drawing at the top of this page. Failure to do so can cause malfunctioning or component failure.

SUMMARY TABLE - PUMP/MOTOR COUPLING KITS

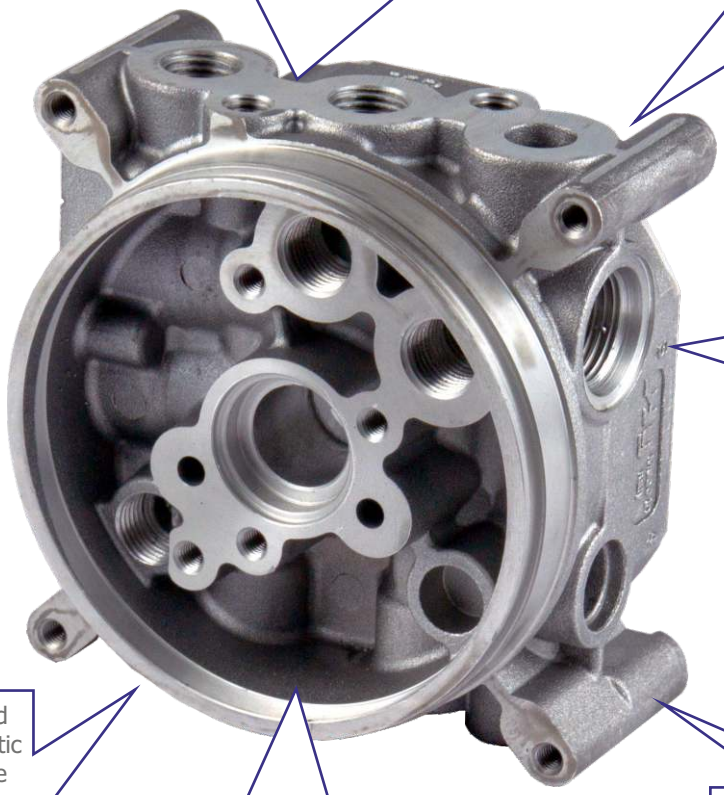
Motor \ Pump	Pump group 0 K - H - R series
DC Ø 80	E36200003
DC Ø 114	E36200002
INTEGRAL AC	E36200003
AC B14 63	NB14 63 (M36100011+E36100000M+F25030002)
AC B14 71	NB14 71 (E36100001+E36100000M+F25030003)

NOTES

MICRO CENTRAL MANIFOLD

A single **universal die-cast aluminium** central manifold in 3 different executions is the core part to realize all power units in industrial, mobile and marine fields. It features the **highest integration and flexibility** on the market, with up to **seven devices** which can be fitted inside, plus a wide selection of manifold blocks which can be connected to cartridge type valves or NG3 valves

The **interface** to hose fittings or external additional manifolds is **unified**. The P and T port tappings for the hose fittings are **1/4" BSPP** (International standard) or **9/16-18UNF** (SAE06) for the American standard execution



Lateral cavities are according **SAE08 standard** (3/4-16UNF), except for the main check valve (5/8-18UNF) and main relief valve (M14)

The **interfaces** to tanks and motors are **unified**. All plastic or steel tanks have the same interface and can be easily swapped.
All AC or DC motors can be fitted easily either directly to the central manifold or through adaptor flanges (B14 IEC standard motors)

Clockwise (our standard) or counterclockwise or bidirectional rotation tang drive shaft **standard gear pumps** can be mounted

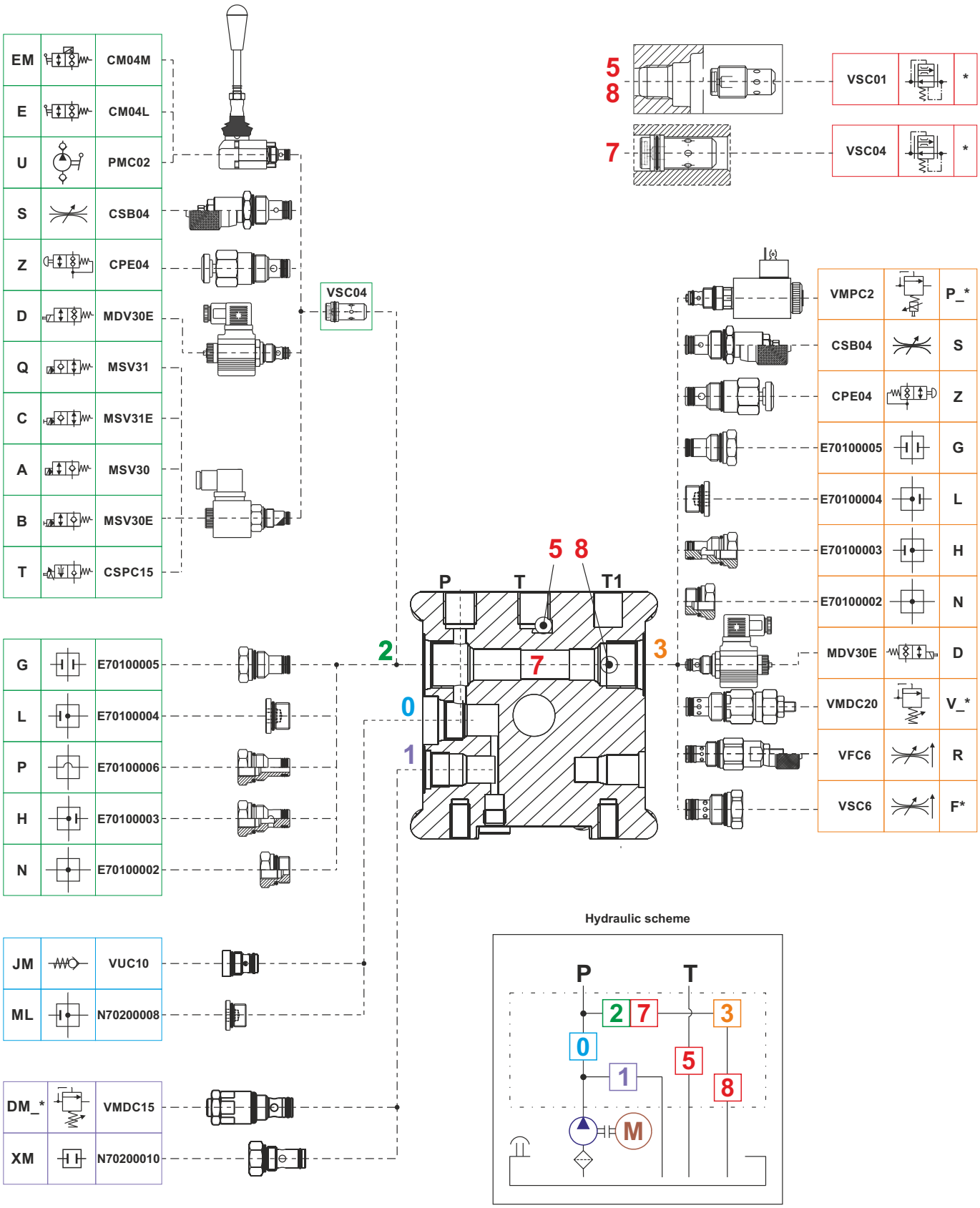
The maximum flow is **6 l/min**, with a **low pressure drop**, and maximum motor power is 2,2kW, well above the average of other alternative products on the market

Which micro central manifold execution should I choose?
MB type is the most widely applied for single acting or double acting circuits. M4 execution is recommended for compact and cost effective double acting circuits with a single cylinder while MR is for bidirectional pump schemes and may integrate double relief valve, double pilot operated check valves and also an extra pilot operated check valve to ensure that differential cylinder circuits function properly (this extra valve discharges excess return flow from the piston side of the cylinder).

Do I need special tools to assemble the components within the central manifold?
No. All valves are screw-in type in a single piece construction (no loose nuts, washers, springs,... difficult to assemble and falling apart). The components are easily assemblable with simple hand tools and hexagon keys.

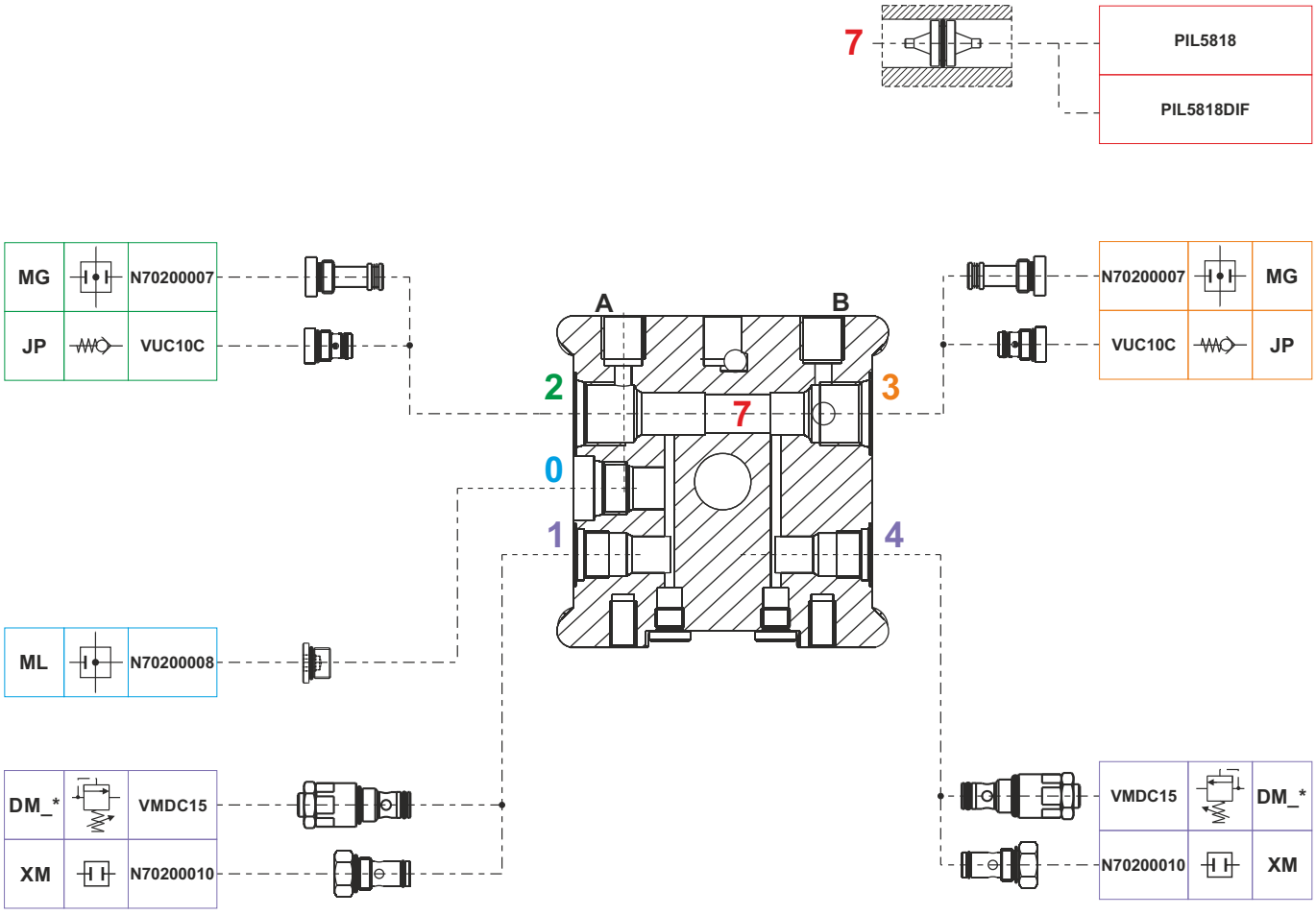
Is the central manifold available as a loose component?
Yes. We can supply either fully assembled and tested power packs or kits of loose components, which can be kept in stock by our worldwide distributors and easily assembled to satisfy local market demand quickly and effectively. Central manifolds and most other components are 100% tested even when supplied as loose parts.

MICRO CENTRAL MANIFOLD «MB» EXECUTION VALVE COMBINATIONS

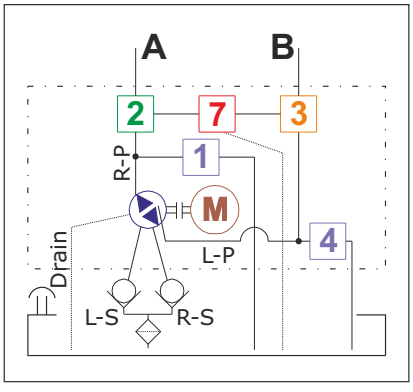


Hydraulic scheme

MICRO CENTRAL MANIFOLD «MR» EXECUTION VALVE COMBINATIONS

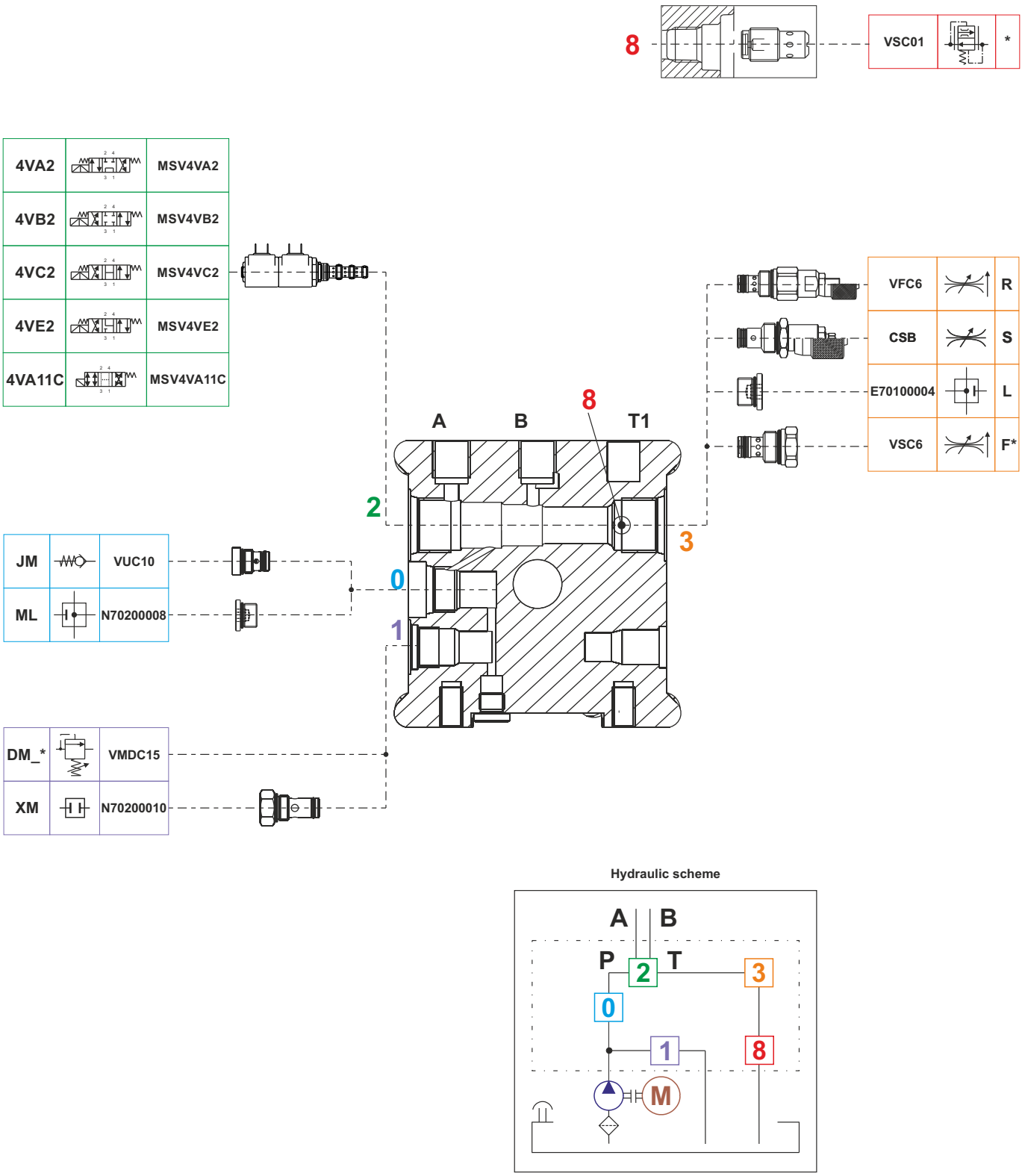


Hydraulic scheme



SECTION B

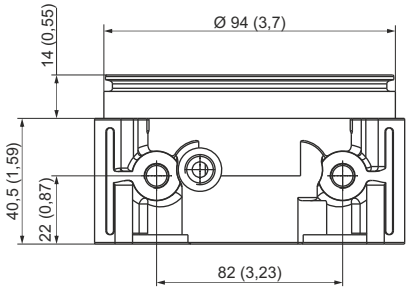
MICRO CENTRAL MANIFOLD «M4» EXECUTION VALVE COMBINATIONS



Hydraulic scheme

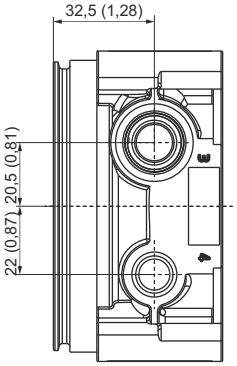
MICRO CENTRAL MANIFOLD OVERALL DIMENSIONS

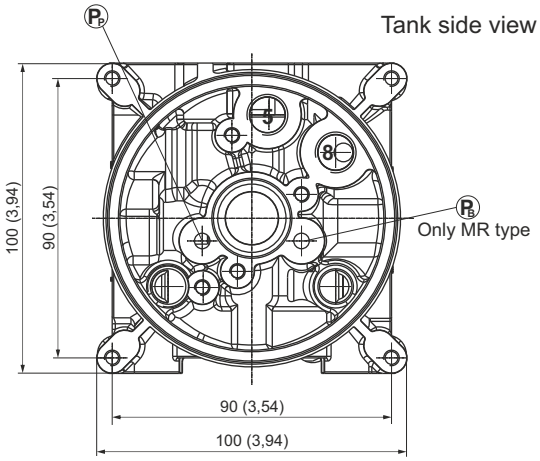
Type	Spare part code
MB	E60102031
MR	E60102032
M4	E60102033
MBUS	E60102031US
MRUS	E60102032US
M4US	E60102033US

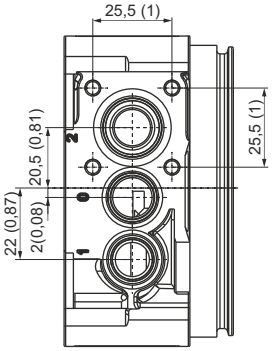


Weight: 0,60 kg (1,32 lb)

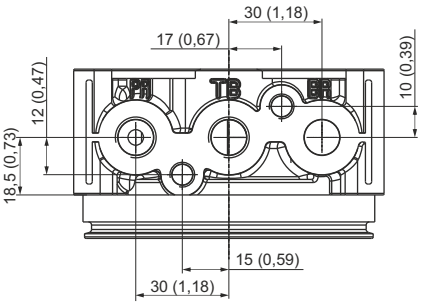
Notes:
- codes ending with US are intended for the American market and are machined with 9/16-18 UNF (SAE06) exit ports.
- all dimensions in mm and (inches)

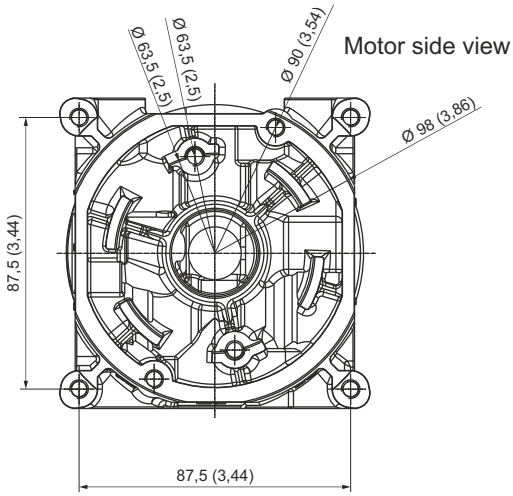






Cavity	Threads
1, 4 (MR type)	M14x1 (relief valve)
0	5/8-18 UNF
2, 3	3/4-16 UNF (SAE 08) 5/8-18 UNF (MR type)
P-T, A-B, T1 (threaded on request only)	1/4 BSPP 9/16-18 UNF (US type)
5, 8	1/4 BSPP
External manifold attachment	2 M8 tie-rods
Tank attachment	4 bolts M5x10
Integral AC motor attachment	4 bolts M6x20
DC motor attachment	2 bolts M6x14 or M6 tie-rods
Pump attachment	2 bolts M5x** (see pump length on the relevant tables)
Foot mounting support attachment	2 bolts M8x16 5/16-24UNF US type
PMC hand pump / CM lever valve cap attachments	4 bolts M5x45





NOTES

GEAR PUMPS

K series. It's the standard choice.
Specifically designed for micro power packs at balanced pressure to improve volumetric efficiency

H series. It's designed and dimensioned with oversized parts for high pressure applications with peaks up to 240 bar

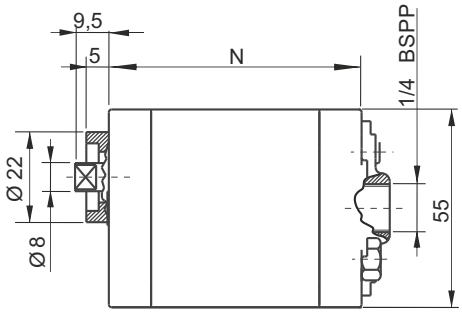
R series. Bidirectional pumps with integrated suction check valves and two front outlet ports.
They can be fitted on MR type central manifold

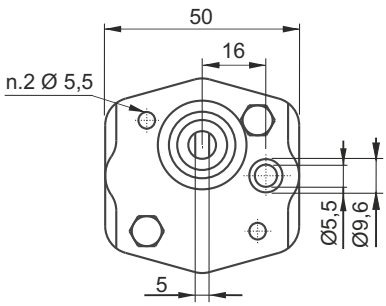
Why are pressure balanced gear pumps better than fixed clearance gear pumps used by some competitors?
Pressure balanced gear pumps are built with lateral compensation plates which reduce the mechanical clearance on the gears as the output pressure increases, greatly improving the volumetric efficiency, reducing heat generation and energy consumption. The mechanical efficiency is always maintained at optimal levels.

Why are the pump technical specifications showing three maximum pressure levels?
Our pumps have three ratings for the maximum allowable pressure: 1-Peak: is the highest one and can be allowed for a maximum cycle of 2 seconds. 2-Intermittent: it can be applied on the pump for a maximum cycle of 20 seconds; 3-Continuous: it can be applied on the pump continuously.

SECTION C

K TYPE GEAR PUMPS





Main features

Oil temperature	-15 ÷ +80 °C
Inlet pressure	0,7 < P < 3,0 bar
Fixing bolts	2 x M5 8.8 steel class tightening torque: 25 Nm
Pressure definition	Peak pressure: cycle 2 s ON Intermittent pressure: cycle 20 s ON Continuous pressure: cycle always ON

Standard rotation direction: clockwise rotation (from shaft side).
Counterclockwise rotation pumps can be mounted on request.
Ask our sales department.

Spare part code

E60 50 40 **

Pump type:
50 = Group 0

Nominal size:
see table

PPM assembly code

KM — **Pump series:**
KM = K series

0,6 — **Nominal displacement**
cc/rev (see table below)

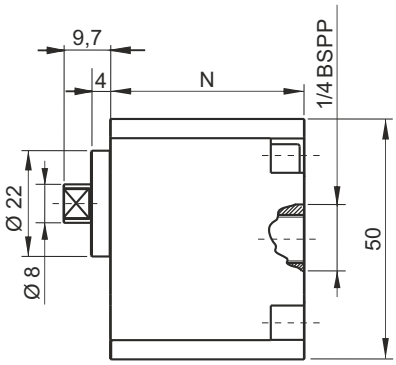
Available range

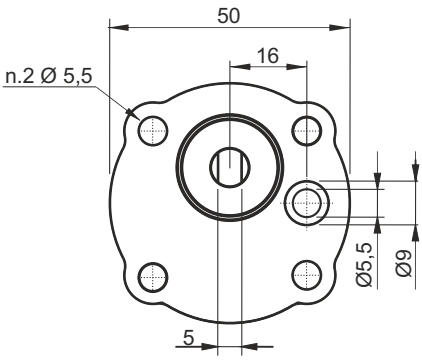
Nominal displacement [cc/rev]	Peak pressure [bar]	Intermittent pressure [bar]	Continuous pressure [bar]	Max speed [rpm]	N [mm]	Bolts* [mm]	Spare part code	Weight [Kg]
0,2	200	180	160	6000	45,5	M5x60	E60504002	0,33
0,4	200	180	160	6000	47,5	M5x65	E60504004	0,35
0,6	200	180	160	6000	51,5	M5x65	E60504006	0,40
0,9	200	180	160	5000	52,5	M5x70	E60504009	0,44
1,3	200	180	160	3900	55,5	M5x70	E60504013	0,49
1,5	200	180	160	3900	57,8	M5x70	E60504015	0,51

Other gear pumps with different pressure and speed available upon request.

* Washers may be fitted to adapt bolt lenght

H TYPE HIGH PRESSURE GEAR PUMPS





Main features

Oil temperature	-15 ÷ +80 °C
Inlet pressure	0,7 < P < 3,0 bar
Fixing bolts	2 x M5 8.8 steel class tightening torque: 25 Nm
Pressure definition	Peak pressure: cycle 2 s ON Intermittent pressure: cycle 20 s ON Continuous pressure: cycle always ON

Standard rotation direction: clockwise rotation (from shaft side).
Counterclockwise rotation pumps can be mounted on request.
Ask our sales department.

Spare part code

E60 50 50 **

Pump type:
50 = Group 0

Nominal size:
see spare part code on table

PPM assembly code

HM — **Pump series:**
HM = H series

0,8 — **Nominal displacement**
cc/rev **(**see below table)

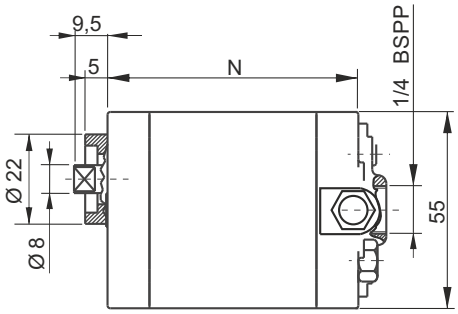
Available range

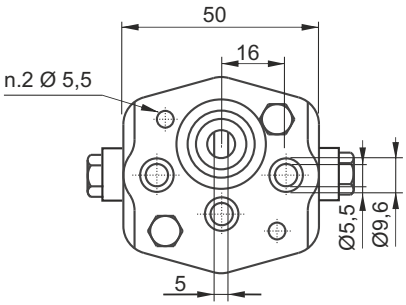
Nominal displacement [cc/rev]	Peak pressure [bar]	Intermittent pressure [bar]	Continuous pressure [bar]	Max speed [rpm]	N [mm]	Bolts* [mm]	Spare part code	Weight [Kg]
0,2	210	180	160	7000	31,9	5x45	E60505001	0,26
0,26	220	200	180	7000	32,3	5x45	E60505002	0,27
0,4	240	220	210	7000	32.8	5x45	E60505004	0,27
0,6	240	220	210	7000	34,4	5x45	E60505006	0,28
0,8	240	220	210	7000	36,1	5x45	E60505008	0,29
1,2	240	220	210	5000	38,9	5x50	E60505012	0,31
1,5	240	220	210	5000	41	5x50	E60505015	0,32

Other gear pumps with different pressure and speed available upon request.

* Washers may be fitted to adapt bolt lenght

R TYPE BIDIRECTIONAL GEAR PUMPS





Main features

Oil temperature	-15 ÷ +80 °C
Inlet pressure	0,7 < P < 3,0 bar
Fixing bolts	2 x M5 8.8 steel class tightening torque: 25 Nm
Pressure definition	Peak pressure: cycle 2 s ON Intermittent pressure: cycle 20 s ON Continuous pressure: cycle always ON

Spare part code

E60 50 45 **

Pump type:
50 = Group 0

Nominal size:
see table

PPM assembly code

RM — **Pump type:**
RM = R series

1,3 — **Nominal displacement:**
cc/rev (see below table)

Available range

Nominal displacement [cc/rev]	Peak pressure [bar]	Intermittent pressure [bar]	Continuous pressure [bar]	Max speed [rpm]	N [mm]	Bolts* [mm]	Spare part code	Weight [Kg]
0,3	200	180	160	6000	52,7	M5x60	E60504503	0,46
0,5	200	180	160	6000	54	M5x60	E60504505	0,48
0,7	200	180	160	6000	55,2	M5x65	E60504506	0,49
0,9	200	180	160	5000	57,1	M5x65	E60504509	0,50
1,3	200	180	160	3900	60,2	M5x70	E60504513	0,51
1,5	200	180	160	3900	62,3	M5x70	E60504515	0,52

Other gear pumps with different pressure and speed available upon request.

* Washers may be fitted to adapt bolt lenght

INTEGRAL COMPONENTS

The **hand pump cartridge** SAE08 (3/4-16UNF), 2 cc/stroke, is an affordable and easy way to add an emergency function to your powerpack

Two way no leakage solenoid valves SAE08 (3/4-16UNF), are available in Normally Open, Normally Closed, single and double locking executions. Manual override also available

Pressure and flow proportional control valves are available as standard, also with integrated **PWM amplifier**

All cartridges are supplied in **single piece**, easily screwable

The **main relief valve** is fitted in a M14 cavity and constructed with **dampening poppet** to increase the accuracy of pressure adjustment and avoid the typical noise of other valves on the market

The **main check valve** fits in SAE06 (5/8-16UNF) standard cavity and can be easily removed from the outside for cleaning and servicing

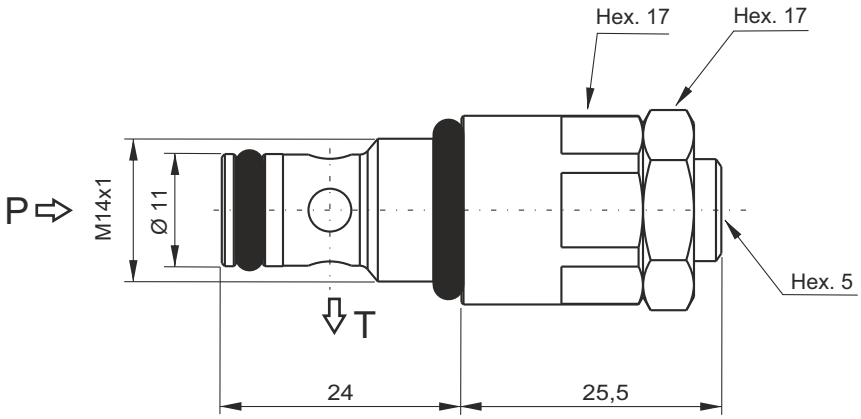
How does the coding of the power pack works?
The power packs are coded with a speaking code, which is basically the list of subassemblies which make up the power pack (motor, pump, valves, tank,...). Integral components are those fitting inside central manifold cavities, which are numbered from 0 to 8. Each component has an assembly code, normally a single letter which compose the speaking code, and a spare part code in case they are ordered as loose components. The numbered cavities are indicated in the hydraulic scheme, so that it is easy to draw it starting from the speaking code itself, and on the central manifold casting too, to simplify assembling.

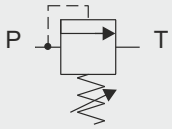
There are several different coils and connectors for the cartridge solenoid valves. How do I choose the correct ones?
Normally closed 2-way solenoid valves (MSV30*) use M130*/M63* series of coils either DC or directly AC. Normally open 2-way solenoid valves (MSV31E) can only use DC or RC (rectified current) coils due to their construction. When choosing a RC not rectified coil, an external rectifying bridge must be applied (ex. by adopting the KA132R*** connectors). MSV4V 4-way cartridge valves use the M63* series coils only. M630 are for DC supply voltage, while M631 are rectified coils with integral rectifying bridge, to be supplied straight with AC current. A standard KA13200000 connector must be always used in this case. On page D180 you will find the coil / connector table for all valves.

Which are the most used plugs?
G or H plugs are normally fitted in cavity 2 of MB central manifold when this cavity is not used for functional valves. L type plug goes in cavity 3 of MB manifolds, when this cavity is not used. MR central manifold cavities 2 and 3 are machined to 5/8-18UNF cavity to allow the mounting of piloted operated check valves. MG plugs must be used there if P. O. check valves are not needed.

SECTION D

VMDC15 - DIRECT ACTING MAIN RELIEF VALVE





Main features

Maximum pressure	280 bar
Maximum flow	15 l/min
Weight	0,06 kg

Recommended tightening torque: 25 Nm
Recommended filtration settings: 25 ÷ 50 µ
Oil temperature: -30 ÷ + 80 °C

Spare part code

VMDC — **Direct acting main relief valve**

15 — **Nominal size:** 15 = 15 l/min

B — **Working range:** L = 10 ÷ 60 bar, B = 20 ÷ 280 bar

1 — **Options:** 1 = screw (std)

Assembly code

DM_*

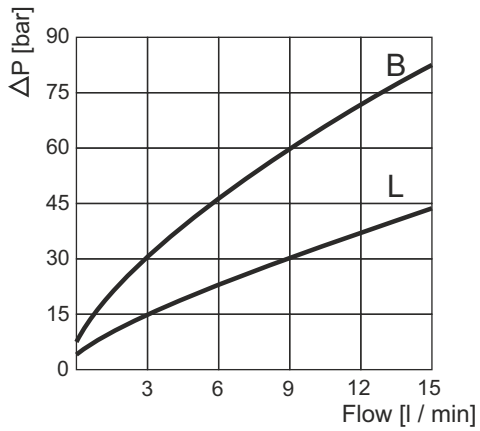
where *** stands for max setting pressure [bar]. Ex. DM_280

Mounting cavities

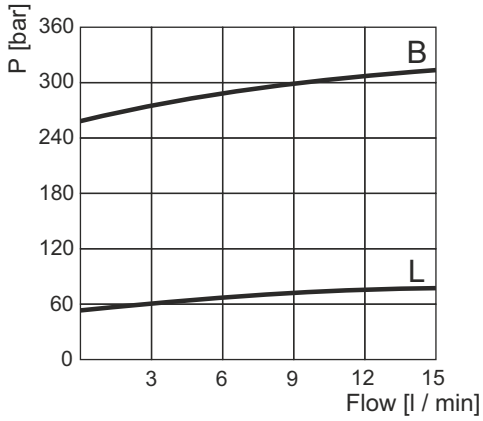
0	**1**			
2	3	**4**		
5		7	8	

Note: cavity 4 only for MR type.

Minimum setting pressure

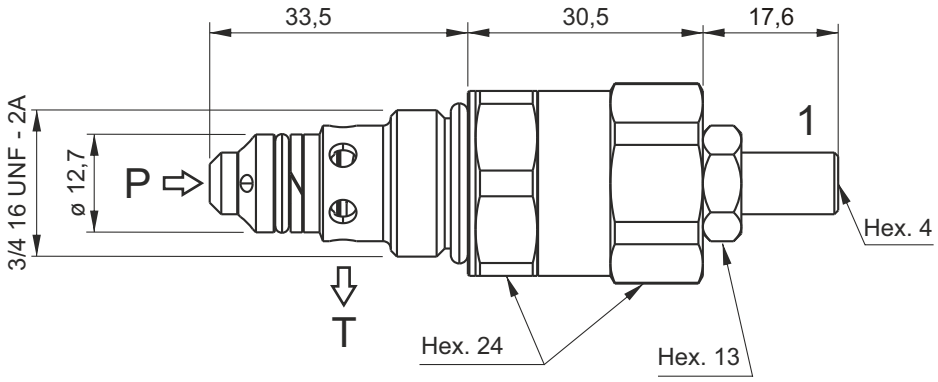


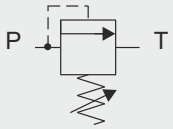
Pressure vs flow



Note: Values measured on valve alone (no cavity) with an oil viscosity of 46 cSt at 50 °C. Pressure drop may change depending on fluid viscosity and temperature

VMDC20 - DIRECT ACTING RELIEF VALVE





Main features

Max pressure	350 bar
Max flow	20 l/min
Weight	0,14 kg

Recommended tightening torque: 40 Nm
Recommended filtration settings: 25 ÷ 50 µ
Oil temperature: -30 ÷ + 80 °C

Spare part code

VMDC — **Direct acting relief valve**

20 — **Nominal size:**
20 = 20 l/min

B — **Working range:**
B = 20 ÷ 120 bar
C = 30 ÷ 250 bar
D = 70 ÷ 350 bar

1 — **Option:**
1 = screw (std)
V = handwheel

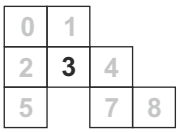
Assembly code

V* ¨**

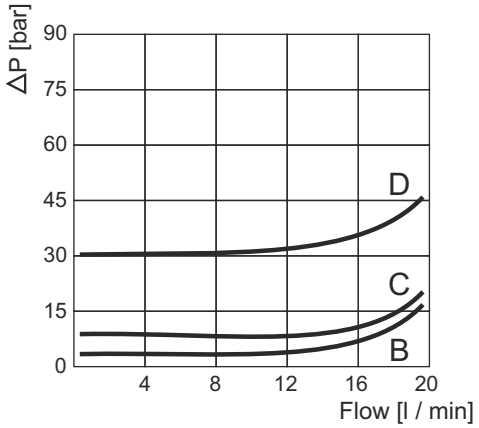
where *** stands for max setting pressure [bar]. Ex. V250

where ¨ is the option

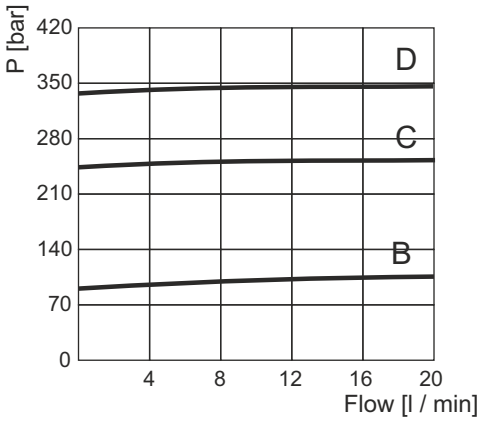
Mounting cavities



Minimum setting pressure

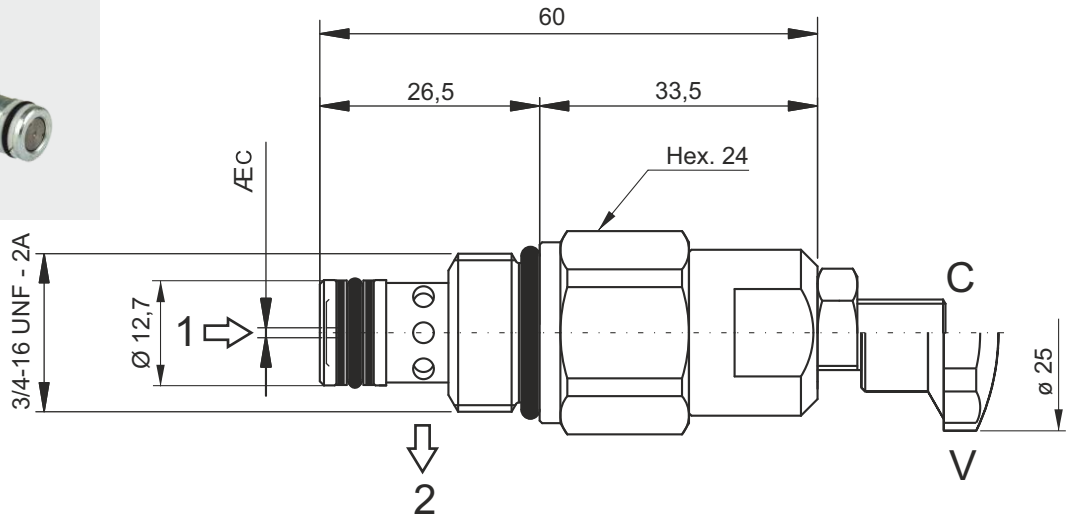


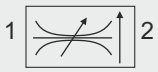
Pressure vs flow



Note: Values measured on valve alone (no cavity) with an oil viscosity of 46 cSt at 50 °C. Pressure drop may change depending on fluid viscosity and temperature

VCF6 - PRESSURE COMPENSATED FLOW CONTROL VALVE





Main features

Max pressure	350 bar
Max flow	18 l/min
Weight	0,11 kg

Recommended tightening torque: 40 Nm
Recommended filtration settings: 25 ÷ 50 µ
Oil temperature: -30 ÷ + 80 °C

Spare part code

VCF6 — **Flow control valve pressure compensated**

***** — **Nominal size:** see table below

C — **Options:** C = screw (std), V = handwheel

Assembly code

R *

Where * is the nominal dimension

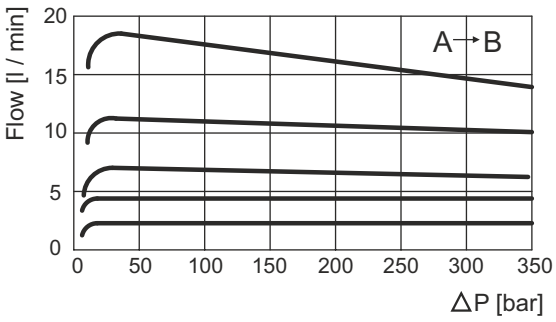
Mounting cavities

0	1			
2	**3**	4		
5		7	8	

Available range

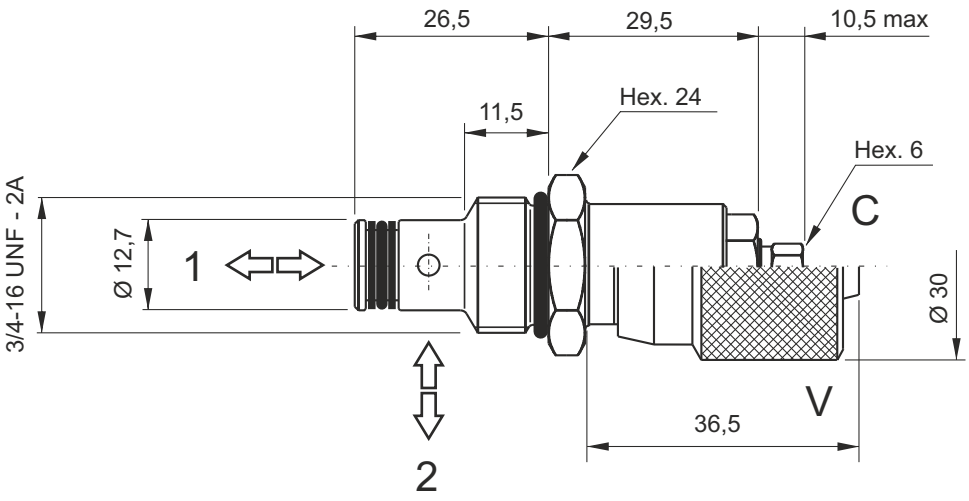
Nominal dimension	ÆC	controlled flow at 100 bar ± 10% l/min
2	0,6	1,0 ÷ 2,2
3	1,0	1,6 ÷ 4,0
4	1,2	2,5 ÷ 5,0
5	1,8	3,0 ÷ 7,0
6	2,8	4,9 ÷ 10,8
7	4,8	8,0 ÷ 18,5

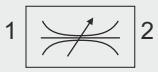
Pressure drop diagram



Note: Values measured on valve alone (no cavity) with an oil viscosity of 46 cSt at 50 °C. Pressure drop may change depending on fluid viscosity and temperature

CSB - BIDIRECTIONAL FLOW CONTROL VALVE





Main features

Max pressure	300 bar
Max flow	15 l/min
Weight	0,08 kg

Recommended tightening torque: 25 Nm
Recommended filtration settings: 25 ÷ 50 µ
Oil temperature: -30 ÷ + 80 °C

Spare part code

CSB — **Flow control valve**

04 — **Nominal size:**
04 = 3/4-16 UNF

C — **Adjustment:**
C = screw (std)
V = handwheel

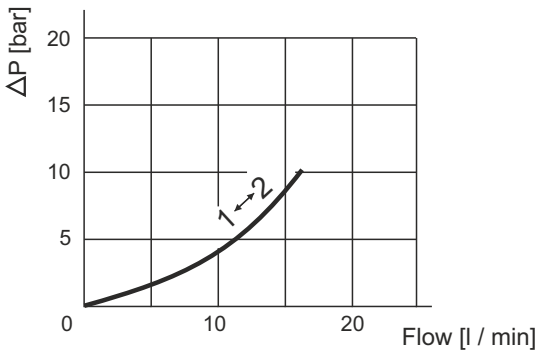
Assembly code

S

Mounting cavities

0	1		
2	**3**	4	
5		7	8

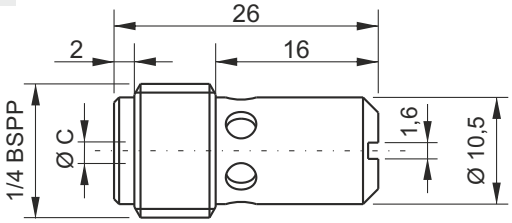
Pressure drop diagram



Note: Values measured on valve alone (no cavity) with an oil viscosity of 46 cSt at 50 °C. Pressure drop may change depending on fluid viscosity and temperature

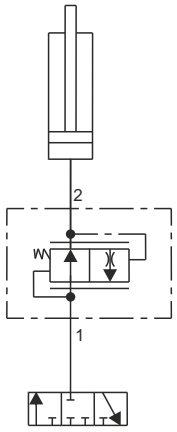
VSC01 - PRESSURE COMPENSATED FIXED FLOW CONTROL VALVE

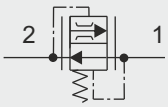
Controlled flow 2 ⇨



⇦ 1 Free flow

Typical application





Main features

Max pressure	300 bar
Max flow	22 l/min
Weight	0,012 kg

Recommended tightening torque: 20 Nm
Recommended filtration settings: 25 ÷ 50 μ
Oil temperature: -30 ÷ + 80 °C

Spare part code

VSC — **Flow control valve pressure compensated**

01 — **Nominal size:** 01

***** — **Controlled flow: [l/min]:** see table

Assembly code

***(01)**

Where * is the nominal flow [l/min]

Mounting cavities

0	1			
2	3	4		
5		7	**8**	

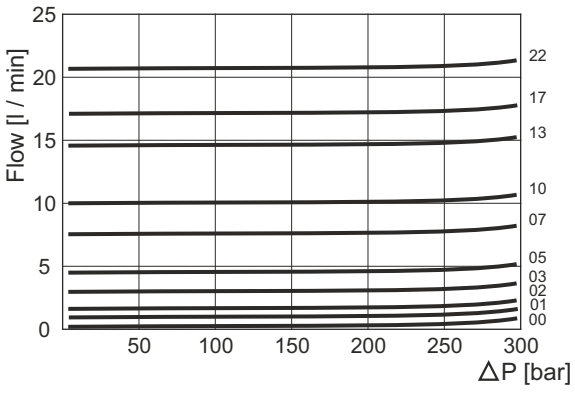
Note: cavity 5 is machined only on central manifold MB, cavity 8 is machined only on central manifolds MB and M4.

Controlled flow

Spare part code	Ø C [mm]	Flow [l/min]
VSC0100	0,8	1
VSC0101	1	1,5
VSC0102	1,25	2
VSC0103	1,5	3
VSC0105	1,75	5
VSC0107	2	7
VSC0110	2,5	10
VSC0113	2,75	13
VSC0117	3	17
VSC0122	3,5	22

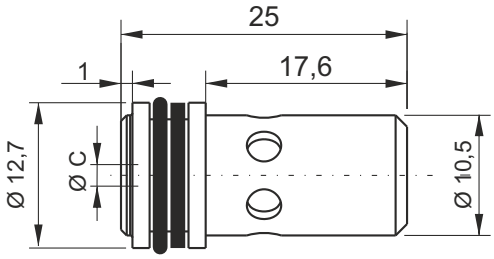
Note: nominal controlled flow, measured at 100 bar with an oil viscosity of 46 cSt at 40 °C, are to be taken as general reference values and must be tested on the field.

Pressure drop diagram

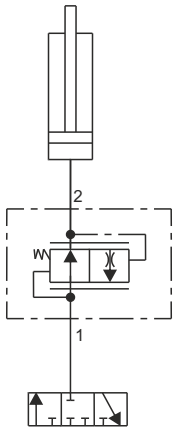


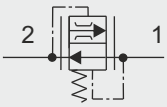
Note: Values measured on valve alone (no cavity) with an oil viscosity of 46 cSt at 50 °C. Pressure drop may change depending on fluid viscosity and temperature

VSC04 - PRESSURE COMPENSATED FIXED FLOW CONTROL VALVE



Typical application





Main features

Max pressure	300 bar
Max flow	22 l/min
Weight	0,012 kg

Cavity mounting: 12,7 H8
Recommended filtration settings: 25 ÷ 50 μ
Oil temperature: -30 ÷ + 80 °C

Spare part code

VSC — **Flow control valve pressure compensated**

04 — **Nominal size:** 04

***** — **Controlled flow [l/min]:** see table

Assembly code

***(04)**

Where * is the nominal flow [l/min]

Mounting cavities

0	1			
2	3	4		
5		**7**	8	

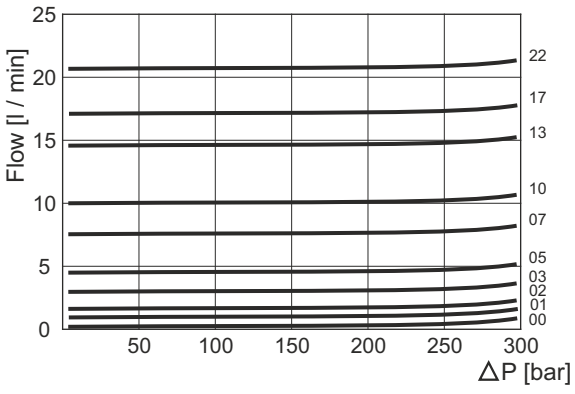
Note: cavity 7 is machined only on central manifold MB and MR.

Controlled flow

Spare part code	Ø C [mm]	Flow [l/min]
VSC0400	0,8	1
VSC0401	1	1,5
VSC0402	1,25	2
VSC0403	1,5	3
VSC0405	1,75	5
VSC0407	2	7
VSC0410	2,5	10
VSC0413	2,75	13
VSC0417	3	17
VSC0422	3,5	22

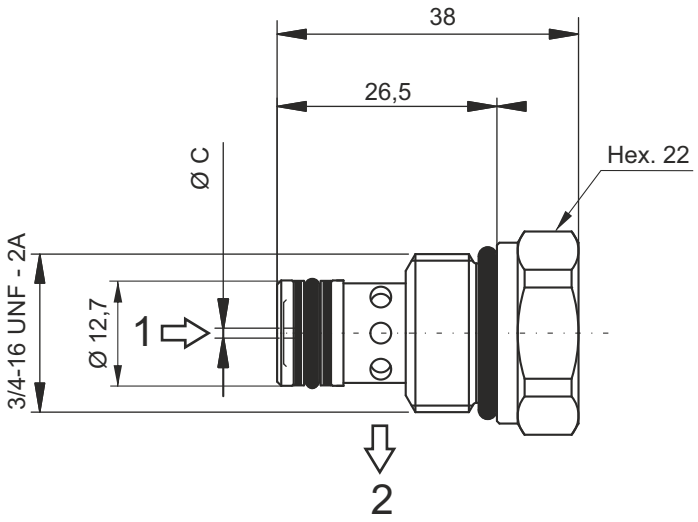
Note: nominal controlled flow, measured at 100 bar with an oil viscosity of 46 cSt at 40 °C, are to be taken as general reference values and must be field tested.

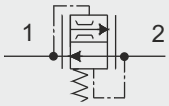
Pressure drop diagram



Note: Values measured on valve alone (no cavity) with an oil viscosity of 46 cSt at 50 °C. Pressure drop may change depending on fluid viscosity and temperature

VSC6 - PRESSURE COMPENSATED FIXED FLOW CONTROL VALVE





Main features

Max pressure	350 bar
Max flow	22 l/min
Weight	0,06 kg

Recommended tightening torque: 25 Nm
Recommended filtration settings: 25 ÷ 50 µ
Oil temperature: -30 ÷ + 80 °C

Spare part code

VSC — **Flow control valve pressure compensated**

6 — **Nominal size:** 6

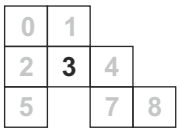
***** — **Nominal flow [l/min]:** see table

Assembly code

F*

Where * is the nominal flow [l/min]

Mounting cavities

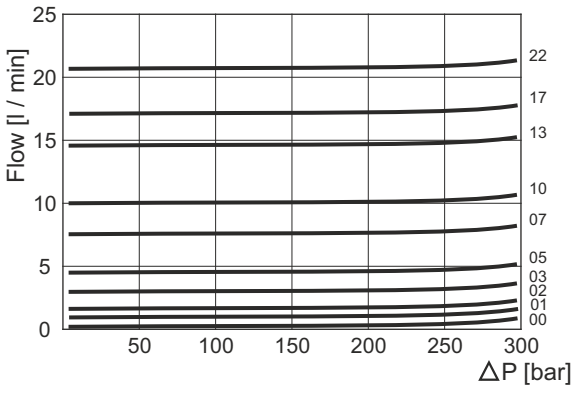


Controlled flow

Spare part code	Ø C [mm]	Flow [l/min]
VSC600	0,8	1
VSC601	1	1,5
VSC602	1,25	2
VSC603	1,5	3
VSC605	1,75	5
VSC607	2	7
VSC610	2,5	10
VSC613	2,75	13
VSC617	3	17
VSC622	3,5	22

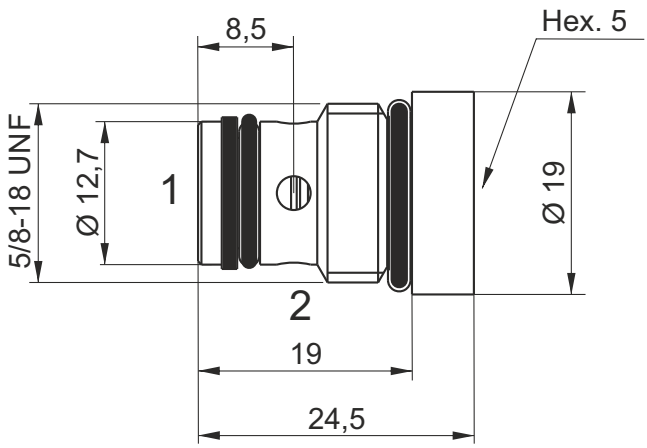
Note: nominal controlled flow, measured at 100 bar with an oil viscosity of 46 cSt at 40 °C, are to be taken as general reference values and must be field tested.

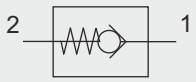
Pressure drop diagram



Note: Values measured on valve alone (no cavity) with an oil viscosity of 46 cSt at 50 °C. Pressure drop may change depending on fluid viscosity and temperature

VUC10 - BASIC CHECK VALVE





Main features

Max pressure	350 bar
Max flow	15 l/min
Weight	0,045 kg
Cracking pressure	1 bar

Recommended tightening torque: 25 Nm
Recommended filtration settings: 25 ÷ 50 µ
Oil temperature: -30 ÷ + 80 °C

Spare part code

VUC — **Check valve**

10 — **Nominal size:** 10

- — **Options:**
- = ball type
C = poppet type

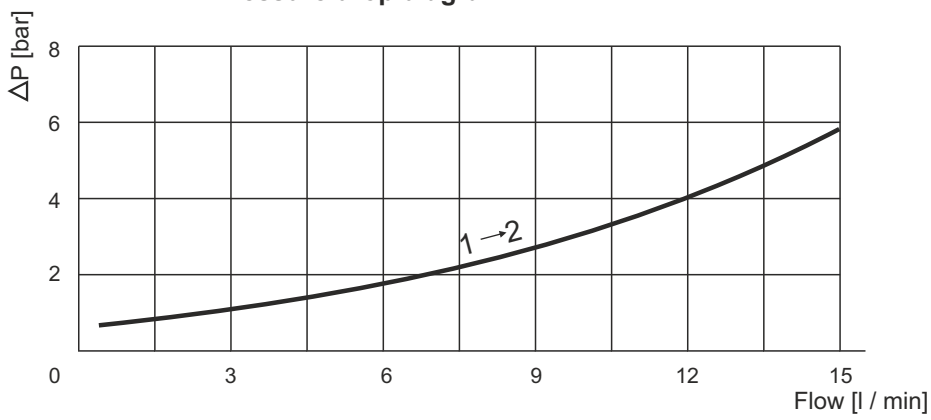
Assembly code

JM (VUC10)
JP (VUC10C)

Mounting cavities

0	1		
2	**3**	4	
5		7	8

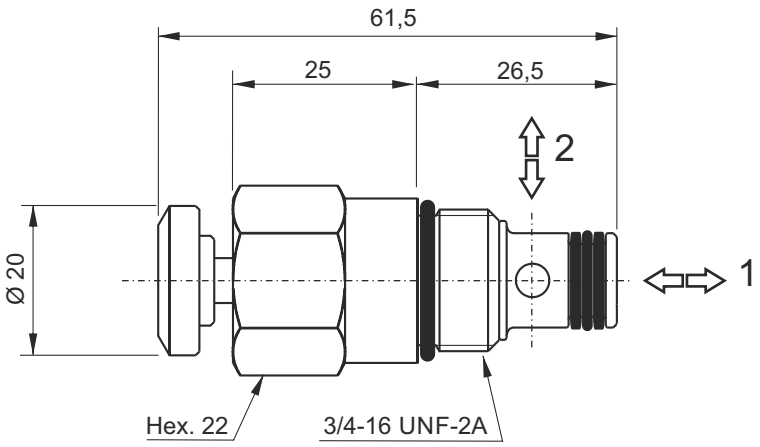
Pressure drop diagram

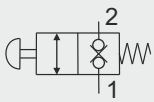


Note: Values measured on valve alone (no cavity) with an oil viscosity of 46 cSt at 50 °C. Pressure drop may change depending on fluid viscosity and temperature

SECTION D

CPE - MANUAL EMERGENCY VALVE





Main features

Max pressure	300 bar
Max flow	25 l/min
Weight	0,12 kg

Recommended tightening torque: 25 Nm
Recommended filtration settings: 25 ÷ 50 µ
Oil temperature: -30 ÷ + 80 °C

Spare part code

CPE — **Two-way manual emergency valve**

04 — **Nominal size:** 04 = 3/4-16 UNF

P — **Operating device:** P = press button

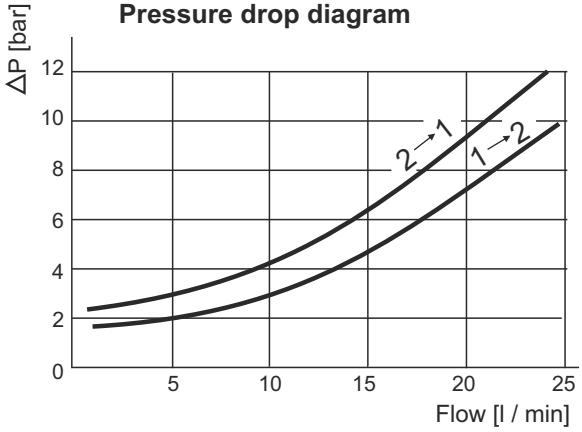
Assembly code

Z

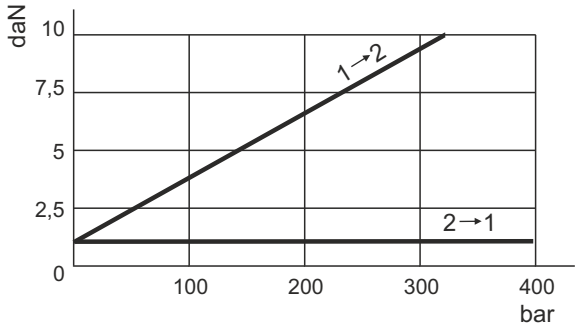
Mounting cavities

0	1		
2	**3**	4	
5		7	8

Pressure drop diagram

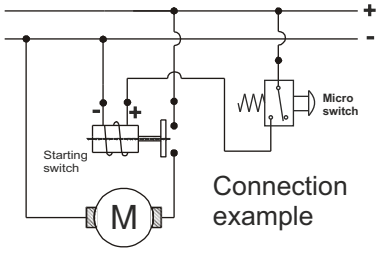


Operating force (daN) on the press button

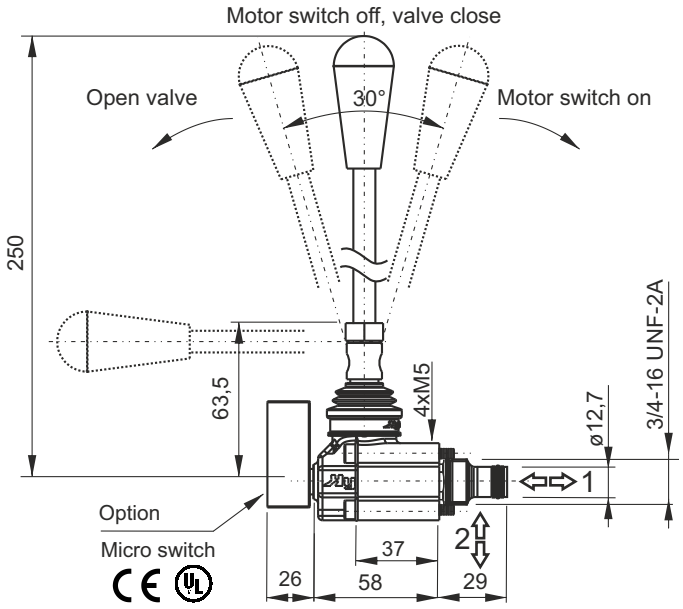


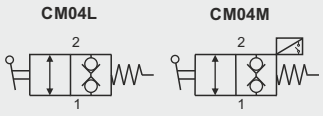
Note: Values measured on valve alone (no cavity) with an oil viscosity of 46 cSt at 50 °C. Pressure drop may change depending on fluid viscosity and temperature

CM - MANUAL LEVER VALVE



Connection example





Main features

Max pressure	300 bar
Max flow	25 l/min
Weight	0,34 kg
Max current	10 A - 400 V
Protection	IP20 (up to IP65 upon request)
Room temp.	-25°C ÷ +85°C (field T extended upon request)

Fixing bolts: 4x M5x45 (tightening torque: 5 Nm)
Recommended cartridge tightening torque: 20 Nm
Recommended filtration settings: 25 ÷ 50 µ
Oil temperature: -30 ÷ + 80 °C

Spare part code

CM — **Two-way manual lever valve**

04 — **Nominal size:** 04 = 3/4-16 UNF

L — **Type:** L = lever (std), M = lever + micro switch

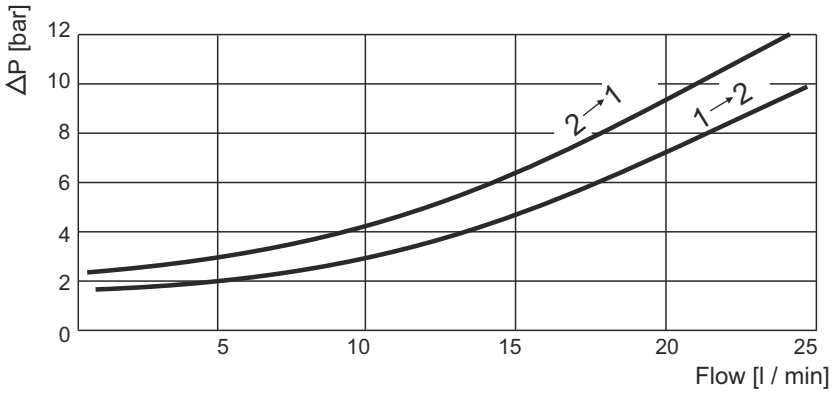
Assembly code

E (CM04L)
EM (CM04M)

Mounting cavities

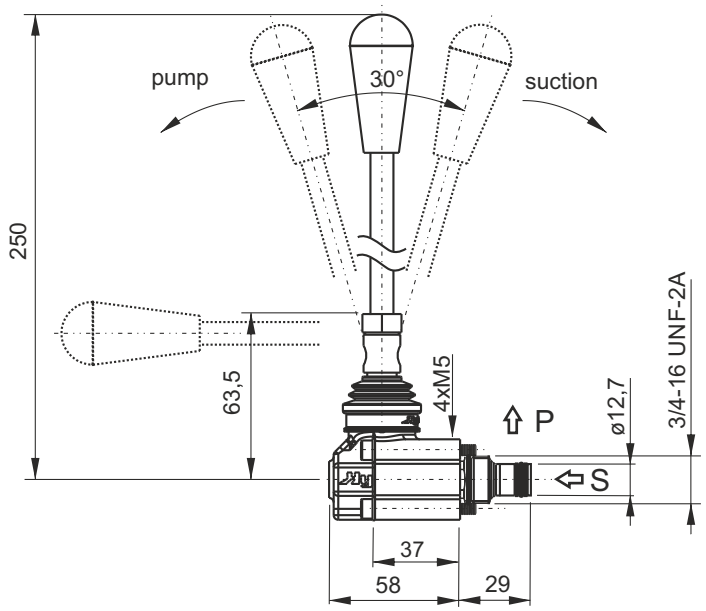
0	1		
2	3	4	
5		7	8

Pressure drop diagram



Note: Values measured on valve alone (no cavity) with an oil viscosity of 46 cSt at 50 °C. Pressure drop may change depending on fluid viscosity and temperature

PMC - CARTRIDGE HAND PUMP



Main features

Max pressure	200 bar
Max flow	-
Weight	0,34 kg

Fixing bolts: 4x M5x45 (tightening torque: 5 Nm)
Recommended cartridge tightening torque: 15 Nm
Recommended filtration settings: 25 ÷ 50 µ
Oil temperature: -30 ÷ + 80 °C

Spare part code

PMC — **Hand pump**

02 — **Nominal size:**
02 = 2 cc/stroke

L — **Type:**
L = lever (std)

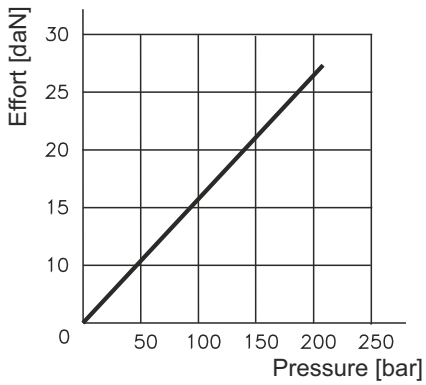
Assembly code

U

Mounting cavities

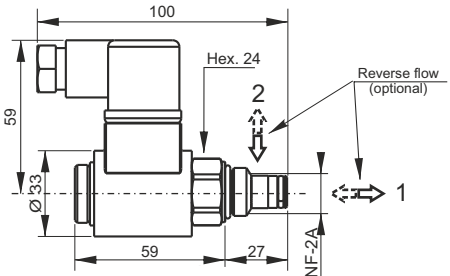
0	1		
2	3	4	
5		7	8

Effort (daN)
operating on the lever end

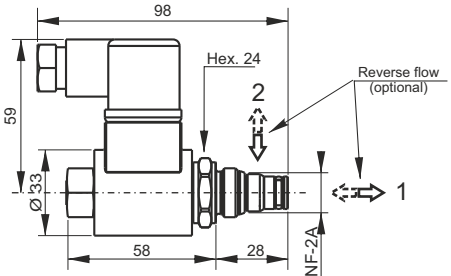


MSV - PILOT OPERATED TWO-WAY SINGLE LOCKING SOLENOID VALVE

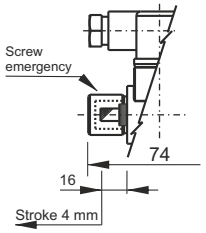
Normally closed

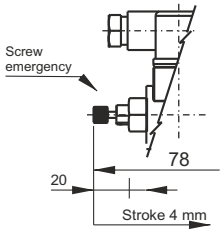


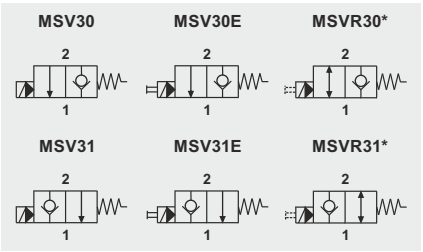
Normally open



Options







Main features

Max pressure	up to 350 bar
Max flow	up to 40 l/min
Weight	0,11 Kg (without coil)
Internal leakage	5 drops/min at 350bar
Response time	30ms (energizing) 50ms (de-energizing)
Available voltages	12VDC 24VDC 24VAC 110RAC 220RAC
Coils (see page D180)	M130 series M630 series M631 series
Standards	EN50081-1/EN50082-2 (89/336 CEE electromagnetic comp.) 73/23/CEE / 96/68/CEE (low voltage)

Recommended tightening torque: 25 Nm
Recommended filtration settings: 25 ÷ 50 µ
Oil temperature: -30 ÷ + 80 °C

Note: Values measured on valve alone (no cavity) with an oil viscosity of 46 cSt at 50 °C. Pressure drop may change depending on fluid viscosity and temperature

Spare part code

MSV — **Two way pilot operated solenoid valve**

- — **Options:**
R = with reversible flow
A = for coil AC

30 — **Esecuzione:**
30 = normally closed
31 = normally open

0 — **Emergency override:**
0 = no emergency (std)
E = emergency

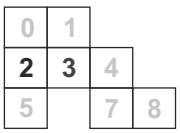
0000 — **Supply voltage:**
0000 = no coil (std)
see D180 table

Assembly code

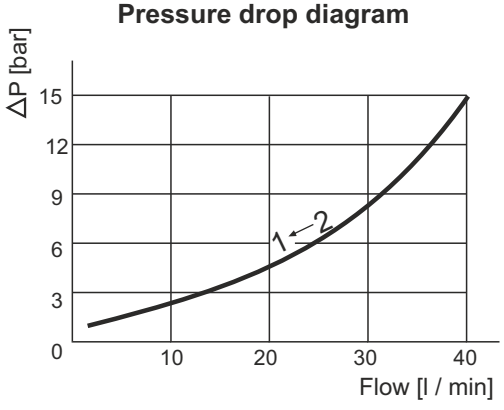
A (MSV30) **Voltage**
B (MSV30E) **Voltage**
Q (MSV31) **Voltage**
C (MSV31E) **Voltage**

Ex: A12DC

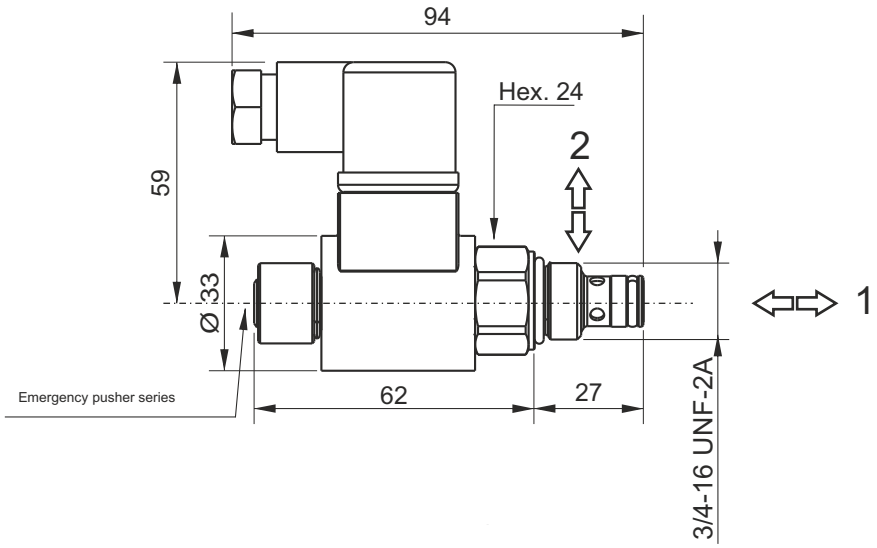
Mounting cavities

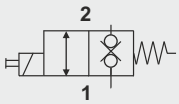


Pressure drop diagram



MDV - DIRECT OPERATED TWO-WAY DOUBLE LOCKING SOLENOID VALVE





Main features

Max pressure	up to 250 bar
Max flow	up to 40 l/min
Weight	0,11 Kg (without coil)
Internal leakage	5 drops/min at 250bar
Response time	20ms (energizing) 40ms (de-energizing)
Available voltages	12VDC 24VDC 24VAC 110RAC 220RAC
Coils (see page D180)	M130 series M630 series M631 series
Standards	EN50081-1/EN50082-2 (89/336 CEE electromagnetic comp.) 73/23/CEE / 96/68/CEE (low voltage)

Recommended tightening torque: 25 Nm
Recommended filtration settings: 25 ÷ 50 µ
Oil temperature: -30 ÷ + 80 °C

Note: Values measured on valve alone (no cavity) with an oil viscosity of 46 cSt at 50 °C. Pressure drop may change depending on fluid viscosity and temperature

Spare part code

MDV — **Two way double locking solenoid valve**

30 — **Operation:**
30 = normally closed

E — **Options:**
E = emergency (std)

0000 — **Supply voltage:**
0000 = no coil (std)
see D180 table

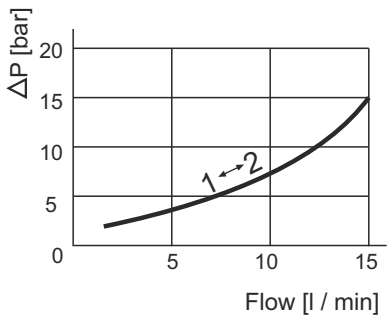
Assembly code

D Voltage
Ex: D24DC

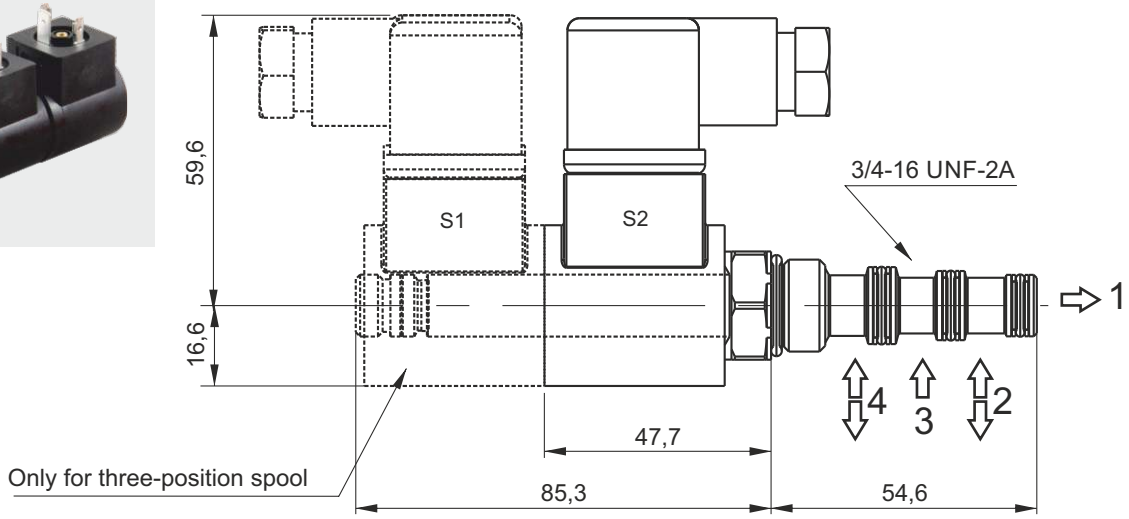
Mounting cavities

0	1		
2	**3**	**4**	
5	6	7	8

Pressure drop diagram



MSV4V - DIRECT OPERATED 4/3 OR 4/2 DIRECTIONAL SPOOL SOLENOID VALVE



Main features

Max pressure	210 bar
Max flow	11,5 l/min
Weight	0,37 Kg (1 solenoid) 0,64 Kg (2 solenoids)
Internal leakage	278 cc/min at 210 bar
Minimum pull-in voltage	85% of nominal
Available voltages	12VDC 24VDC 24VAC 110RAC 220RAC
Coils (see page D180)	M630 series M631 series
Standards	EN50081-1/EN50082-2 (89/336 CEE electromagnetic comp.) 73/23/CEE / 96/68/CEE (low voltage)

Recommended tightening torque: 25 Nm
Recommended filtration: 25 ÷ 50 µ
Oil temperature: -30 ÷ + 80 °C

Spare part code

MSV4V — **4/2 or 4/3 directional spool solenoid valve**

A2 — **Spool and scheme:** see below table

00 — **Options:** 00 = std

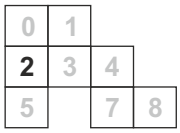
24DC — **Supply voltage:** see D180 table

Assembly code

4VA2 Voltage

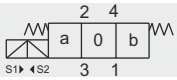
Ex: 4VA2 24DC

Mounting cavities

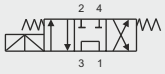
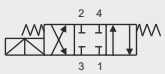


Note: MSV4V can be mounted on central manifold type M4 only.

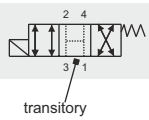
Spool

Code	
	

Double solenoid

A2	
B2	
C2	
E2	

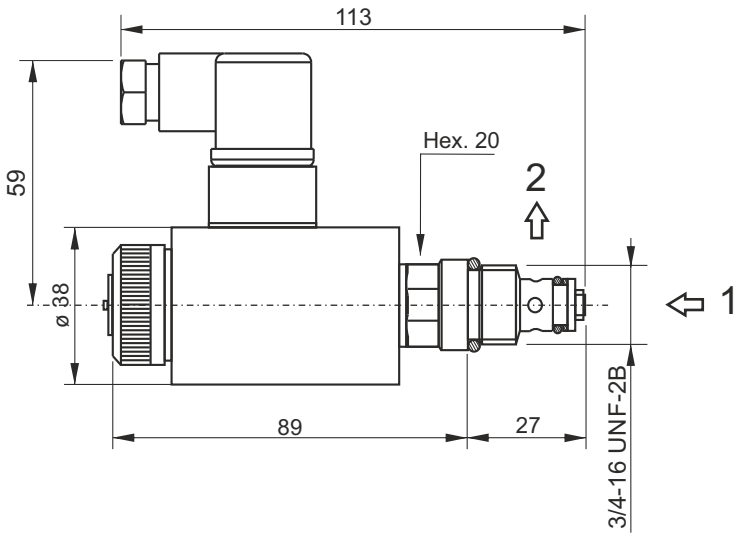
Single solenoid

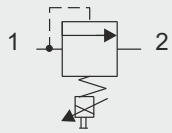
A11C	

SECTION D

VMPC2 - PROPORTIONAL RELIEF VALVE

CE





Main features

Max pressure	350 bar
Max flow	2l/min
Weight	0,46 Kg
PWM	120Hz
Hysteresis	5%
Duty cycle	ED 100%
Voltage	+/- 10% nominal voltage
Standards	EN50081-1/EN50082-2 (89/336 CEE electromagnetic comp.) 73/23/CEE / 96/68/CEE (low voltage)

Recommended tightening torque: 30 Nm
Recommended filtration: 10 ÷ 25 μ
Oil temperature: -40 ÷ + 80 °C

For the controller see table D170

Note: Supplying current to the coil from 0 to I max (see below diagram), a proportional pressure variation is obtained on port 1.

Coils selection

Supply voltage	Spare coil code	Spare connector code
12DC	98001190	KA132000B1
24DC	98002190	KA132000B1

Spare part code

VMPC — Direct acting proportional relief valve

2 — Nominal size:
2 = 2 l/min

C — Working range:
A = 2 ÷ 80 bar
C = 4 ÷ 250 bar

E — Options:
E = emergency (std)

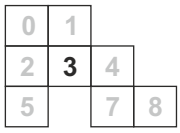
0000 — Supply voltage:
- 0000 = no coil
- 12DC
- 24DC

Assembly code

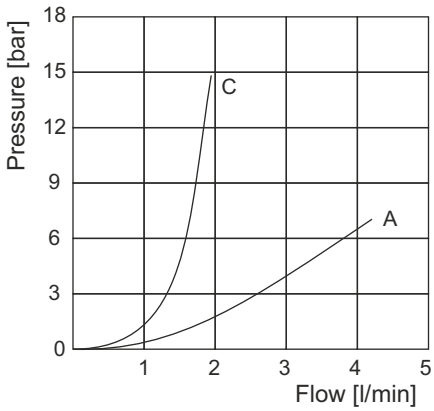
P* Voltage**

where *** stands for max setting pressure [bar]. Ex. P25012DC

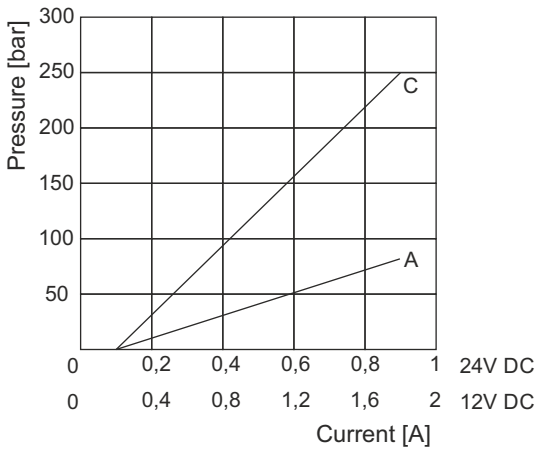
Mounting cavities



Pressure drop

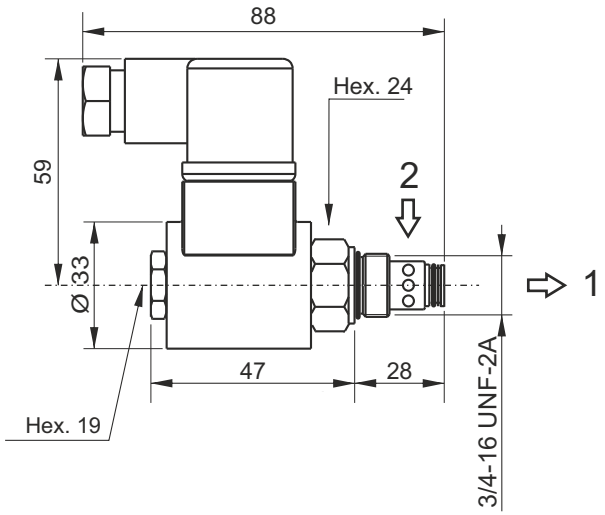


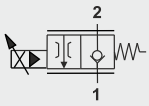
Pressure vs current



Note: Values measured on valve alone (no cavity) with an oil viscosity of 46 cSt at 50 °C. Pressure drop may change depending on fluid viscosity and temperature

CSPC15 - PROPORTIONAL FLOW CONTROL VALVE





Main features

Max press.	210 bar
Max flow	22 l/min
Weight	0,1 Kg (without coil)
PWM	120Hz
Hysteresis	5% (10% above 85% I max)
Duty cycle	ED 100%
Voltage	+/- 10% nominal voltage
Standards	EN50081-1/EN50082-2 (89/336 CEE) 73/23/CEE / 96/68/CEE
Oil temperature	-40 - +120°C
Filtration	10 ÷ 25 µ
Tightening torque	30Nm

Spare part code

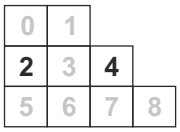
CSPC	**Proportional flow control valve**
15	**Nominal size:** 15 = 15 l/min
0	**Option:** 0 = no option
0000	**Supply voltage:** - 0000 = no coil - 12DC - 24DC

Assembly code

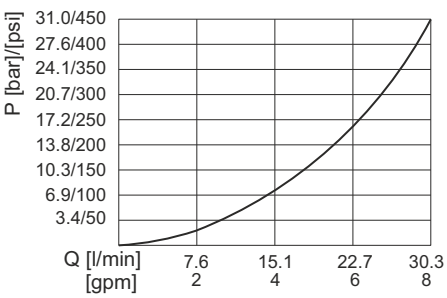
T* Voltage**

ex: T12DC

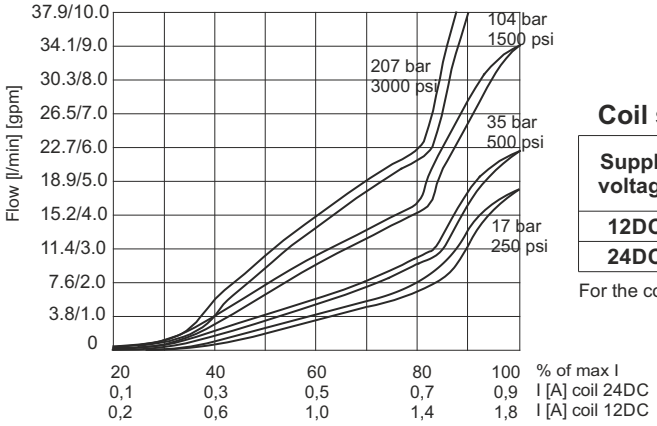
Mounting cavities



Pressure Drop 2 > 1 with fully open valve



Flow vs current at different pressure drops



Coil selection

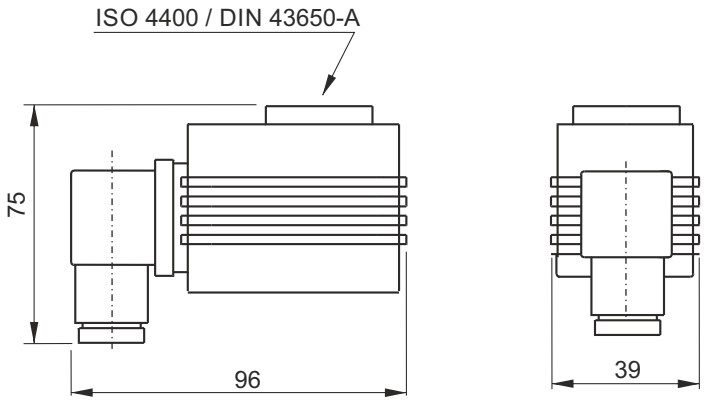
Supply voltage	Spare coil code	Spare connector code
12DC	M6306012	KA132000B1
24DC	M6306024	KA132000B1

For the controller see table D170

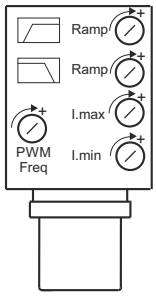
Note: Values measured on valve alone (no cavity) with an oil viscosity of 46 cSt at 50 °C.
Pressure drop may change depending on fluid viscosity and temperature.

SECTION D

VPC - ELECTRONIC AMPLIFIER FOR PROPORTIONAL SOLENOID VALVES



CE



Main features

Supply voltage	12 / 24VDC
Voltage input signal range	0 ~ 10 V
Max current range	2,5A
PWM (optionally adjustable)	120 Hz (50 ÷ 400 Hz)
Ramp adjustment (independent)	5%
Input impedance	100 kohm
Voltage required	+/- 10% nominal voltage
Weight	0,11 kg
Standards	EN50081-1/EN50082-2 (89/336 CEE electromagnetic comp.) 73/23/CEE / 96/68/CEE (low voltage)

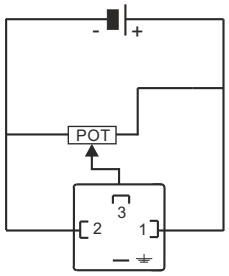
Spare part code

VPC — **Electronic amplifier for solenoid valves**

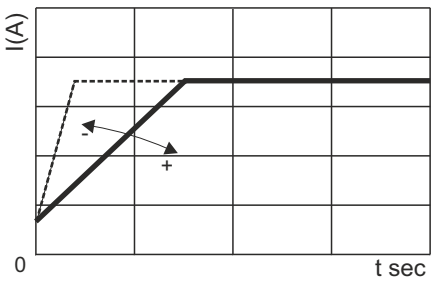
00 — **Options**

Suitable for:
- CSPC15**** proportional flow control valve
- VMPC2**** proportional pressure relief valve

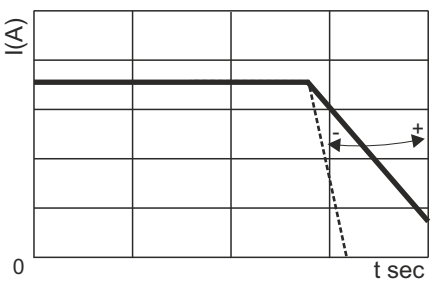
Electric scheme



Ramp adjustment (up)



Ramp adjustment (down)



Instruction for use:

1) turn completely “I MIN” trimmer in counterclockwise direction;
2) adjust the external voltage input signal to the initial regulating (flow or pressure) value;
3) turn “I MIN” trimmer in clockwise direction until valve starts regulating;
4) adjust the external voltage input signal to the max value and adjust “I MAX” trimmer until the valve regulates the maximum flow or pressure on the hydraulic system.

INTEGRAL VALVE COILS

M630* / M631*

M130*

09800*

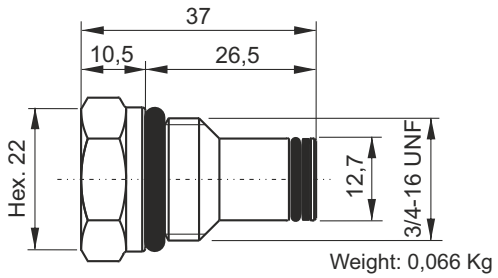
CE

Supply voltage [V]	Assembly code	Coil type	Spare part code	Spare connector code	Holding power [W]	Duty chargeED [%]	Prot. class	Weight [g]	Suitable for valve series
12DC	12DC_M630	DC	**M6306012**	KA132000B1	18W	100	H	130	MSV30/31 MDV MSV4V CSPC15
24DC	24DC_M630	DC	**M6306024**	KA132000B1	18W	100	H	130	MSV30/31 MDV MSV4V CSPC15
24AC	24AC_M631	RC with integrated rectifying bridge	**M6316024**	KA132000B1	18W	100	H	130	MSV30/31 MDV MSV4V
115AC	115AC_M631	RC with integrated rectifying bridge	**M6316115**	KA132000B1	18W	100	H	130	MSV30/31 MDV MSV4V
230AC	230AC_M631	RC with integrated rectifying bridge	**M6316230**	KA132000B1	18W	100	H	130	MSV30/31 MDV MSV4V
12DC	12DC_M130	DC	**M13040001**	KA132000B1	18W	75	H	139	MSV30 MSV31 MDV
115AC 50Hz	115AC_50AC_ M130	AC - not usable on NO valves	**M13040006**	KA132000B1	28VA	75	H	139	MSV30 MDV
115AC	110RAC_M130	RC - needs external rectifying connector	**M13040004**	KA132R12B1	18W	75	H	139	MSV30 MSV31 MDV
230AC	220RAC_M130	RC - needs external rectifying connector	**M13040005**	KA132R13B1	18W	75	H	139	MSV30 MSV31 MDV
12DC	Integrated code in the proportional valve VMPC2 code	DC	**98001190**	KA132000B1	36W	100	H	257	VMPC2
24DC	Integrated code in the proportional valve VMPC2 code	DC	**98002190**	KA132000B1	36W	100	H	247	VMPC2

Other voltages and electric connector types (Amp Junior, flying leads,...) available on request.
Inrush power consumption can be up to 3,5 times higher than the holding one.
Coil thermal insulation: Class H. Electric connection: DIN 43650-A / ISO 4400. Coil protection degree: IP65

SECTION D

PLUGS



Weight: 0,066 Kg

Hydraulic symbol

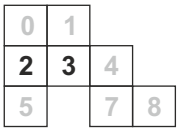
Spare part code

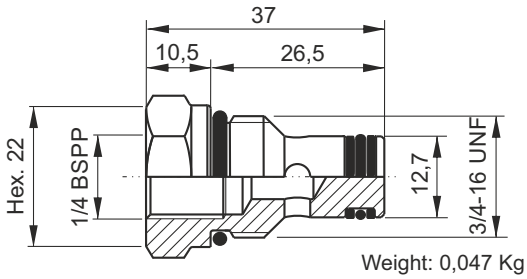
E70100005

PPM assembly code

G

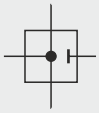
Mounting cavities





Weight: 0,047 Kg

Hydraulic symbol



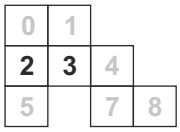
Spare part code

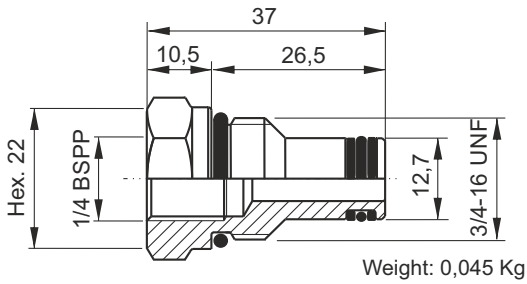
E70100003

PPM assembly code

H

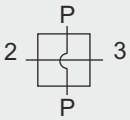
Mounting cavities





Weight: 0,045 Kg

Hydraulic symbol



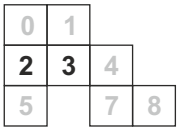
Spare part code

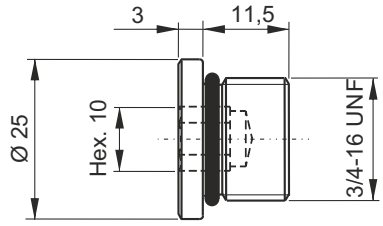
E70100006

PPM assembly code

P

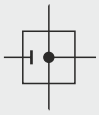
Mounting cavities





Weight: 0,027 Kg

Hydraulic symbol



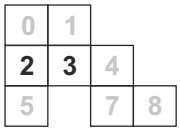
Spare part code

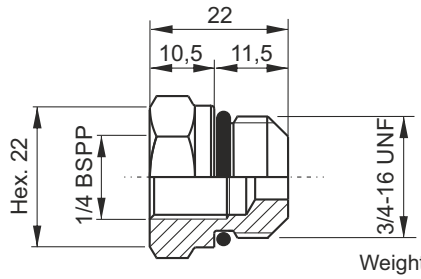
E70100004

PPM assembly code

L

Mounting cavities





Weight: 0,042 Kg

Hydraulic symbol

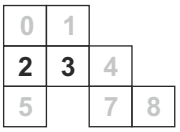
Spare part code

E70100002

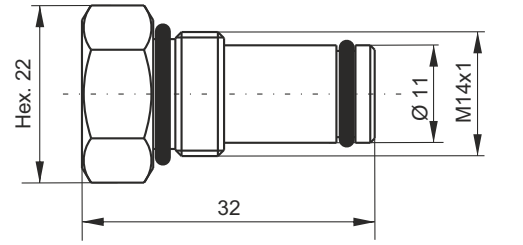
PPM assembly code

N

Mounting cavities

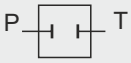


PLUGS



Weight: 0,110 Kg

Hydraulic symbol



Spare part code

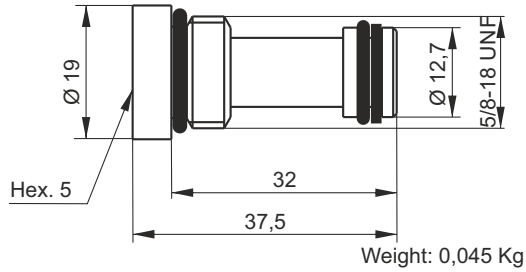
N70200010

PPM assembly code

XM

Mounting cavities

0	**1**		
2	3	**4**	
5		7	8



Weight: 0,045 Kg

Hydraulic symbol

Spare part code

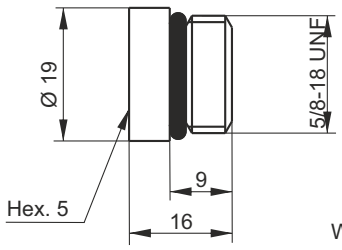
N70200007

PPM assembly code

MG

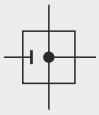
Mounting cavities

0	1		
2	**3**	4	
5		7	8



Weight: 0,027 Kg

Hydraulic symbol



Spare part code

N70200008

PPM assembly code

ML

Mounting cavities

0	1		
2	**3**	4	
5		7	8

Note: cavities 2 and 3 are machined SAE08 (3/4-16UNF) in central manifold MB and 5/8-18UNF in central manifold MR.
Cavity 2 is machined SAE08-4way in central manifold M4.
Cavity 4 is machined only in reversible central manifold MR.

NOTES

TANKS

Round steel tanks from **0,7** to **2,4 l**, for horizontal and vertical mounting

Square plastic tanks, from **1** to **3,5 l**, for horizontal and vertical mounting. Thanks to the special shape can be screwed to the body with automatic screw driver

Round plastic tanks from **0,4** to **1,2 l**, for horizontal and vertical mounting

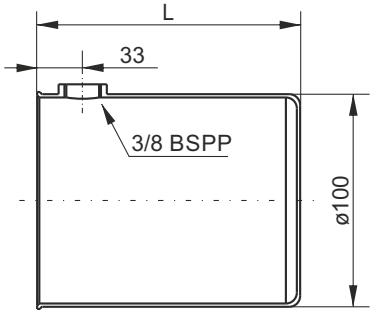
Better plastic or steel tanks?
Plastic tanks have several advantanges. Among them: they do not corrode, the oil level is visible, they do not damage if they get bumped,... On the other hand steel tanks are to be preferred in case of ultra high or ultra low temperatures.

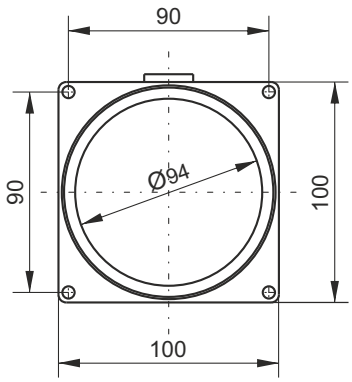
Is it possible to design and make custom made tanks?
Yes. We can provide an adaptor flange (F80000012) which can welded on custom made steel tanks, by the customer.

How do I order spare tanks?
Tanks can be ordered without accessories just by adding a J in front of the relevant code (ex. JE50404006 instead of E50404006). When ordered with the normal code (ex. E50404006) all relevant accessories are included (plugs, filler breather, fixing devices,... depending on the kind of tank).
Tanks specified in assembly code (ex. 2,4HV) always include all relevant accessories.

ROUND STEEL TANKS F & H SERIES

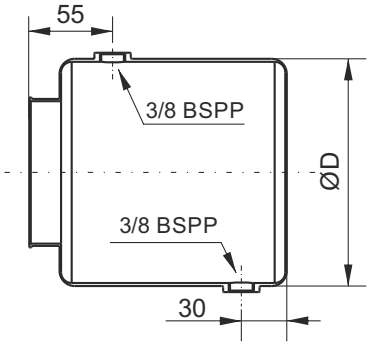
Recommended tightening torque for 3/8" BSPP: 10 Nm

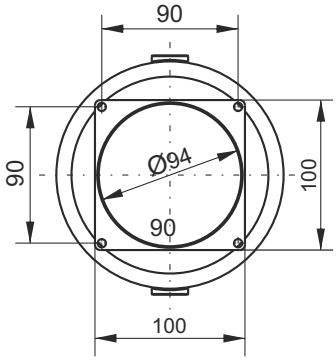




Description	Spare part code	Assembly code	L (mm)	Weight	Actual filling volume (lt)	
					Horizontal	Vertical
0,7 l cylindrical horizontal / vertical mounting	**E50403001**	**0,7F / 0,7FV**	120	0,26 Kg	0,75	0,52
1,2 l cylindrical horizontal / vertical mounting	**E50403002**	**1,2F / 1,2FV**	186	0,38 Kg	1,1	0,9

Recommended tightening torque for 3/8" BSPP: 10 Nm



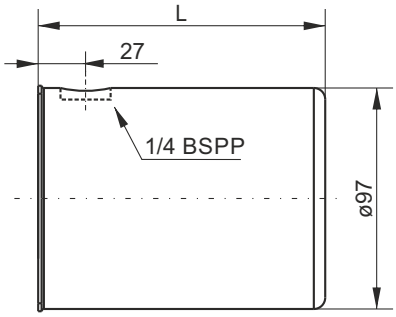


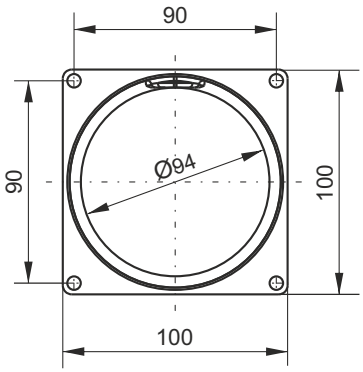
Description	Spare part code	Assembly code	L (mm)	ØD (mm)	Weight	Actual filling volume (lt)	
						Horizon.	Vert.
1,7 l cylindrical horizontal / vertical mounting	**E50404004**	**1,7H / 1,7HV**	170	120	0,64 Kg	1,5	1,2
2,4 l cylindrical horizontal / vertical mounting	**E50404006**	**2,4H / 2,4HV**	170	150	0,8 Kg	2,4	1,8

Material	Fe P04-EN10130 steel sheet 1,5 mm thickness
Fluid	Mineral based oil ISO/DIN 6743/4
Working temperature	-15 / +70°C

Note: the piping kit, standard suction filter, filler/breather and discharge plug are included when specifying the tank in PPM assembly code
When ordering spare parts, only the discharge plug and filler/breather are included

ROUND PLASTIC TANKS R SERIES





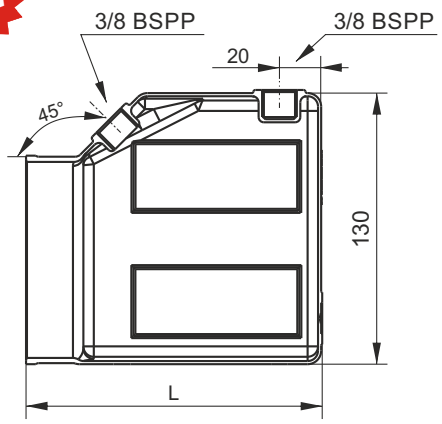
Description	Spare part code	Assembly code	L (mm)	Weight	Actual filling volume (lt)	
					Horizontal	Vertical
0,4 l round horizontal / vertical mounting	**H50403001**	**0,4R / 0,4RV**	90	0,07 Kg	0,45	0,35
0,7 l round horizontal / vertical mounting	**H50403002**	**0,7R / 0,7RV**	124	0,09 Kg	0,75	0,62
1,2 l round horizontal / vertical mounting	**H50403003**	**1,2R / 1,2RV**	186	0,14 Kg	1,17	1,05

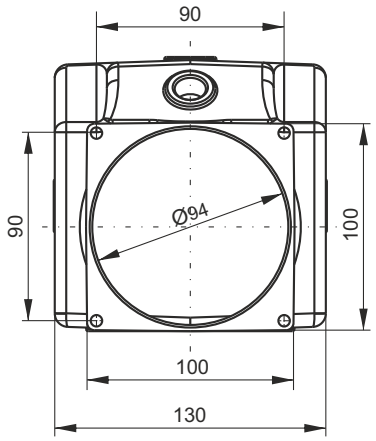
Material	PE-HD neutral / transparent color (DO NOT EXPOSE TO DIRECT SUNLIGHT)
Fluid	Mineral based oil ISO/DIN 6743/4
Working temperature	-15 / +70°C

Note: the piping kit, standard suction filter, filler/breather and discharge plug are included when specifying the tank in PPM assembly code
When ordering spare parts, only the discharge plug and filler/breather are included

SECTION E

SQUARE PLASTIC TANKS T SERIES





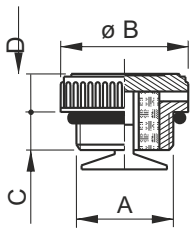
Description	Spare part code	Assembly code	L (mm)	Weight	Actual filling volume (lt)	
					Horizontal	Vertical
1 l square horizontal / vertical mounting	**H50403005**	**1T / 1TV**	125	0,23 Kg	1,0	0,8
1,5 l square horizontal / vertical mounting	**H50403007**	**1,5T / 1,5TV**	150	0,24 Kg	1,4	1,2
2 l square horizontal / vertical mounting	**H50403009**	**2T / 2TV**	211	0,34 Kg	2,2	2,0
2,7 l square horizontal / vertical mounting	**H50403011**	**2,7T / 2,7TV**	261	0,40 Kg	2,7	2,7
3,5 l square horizontal / vertical mounting	**H50403013**	**3,5T / 3,5TV**	326	0,49 Kg	3,7	3,9

Material	PE-HD neutral / transparent color (DO NOT EXPOSE TO DIRECT SUNLIGHT)
Fluid	Mineral based oil ISO/DIN 6743/4
Working temperature	-15 / +70°C

Note: the piping kit, standard suction filter, filler/breather and discharge plug are included when specifying the tank in PPM assembly code
When ordering spare parts, only the discharge plug and filler/breather are included

TANK PLUGS AND ACCESSORIES

Knurled filler breather with vane 1/4" - 3/8" BSPP



	1/4"	3/8"
A	1/4"	3/8"
B	21,5	21,5
C	11	13
D	16	16

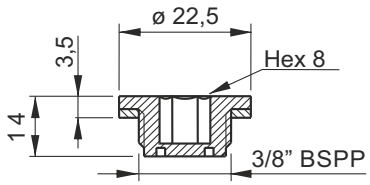
Weight: 0,01 Kg

Suitable for R type tanks (1/4" BSPP)
Suitable for F/H/T type tanks (3/8" BSPP)

Spare part code

C75100001 (1/4 BSPP)
C75100002 (3/8 BSPP)

Drain plug



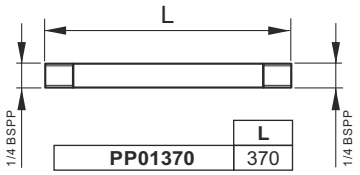
Weight: 0,01 Kg

Suitable for F/H/T type tanks

Spare part code

TCNB0702 (plastic)

1/4" return/suction pipe



	L
PP01370	370

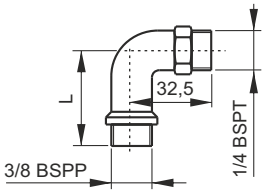
Recommended as suction pipe for PMC02 hand pumps and as return pipe with C3420001 return filter.

Weight: 0,04 Kg

Spare part code

PP01370

90° elbow for suction pipe M 1/4" BSPT - M 3/8" BSPP



Weight: 0,01 Kg

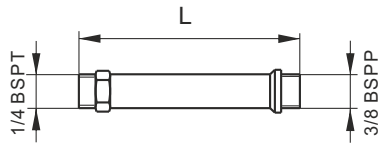
	L
PP01E40	40
PP01E77	77

Recommended for horizontal tanks

Spare part code

PP01E**

Suction pipe



Weight: 0,01 Kg

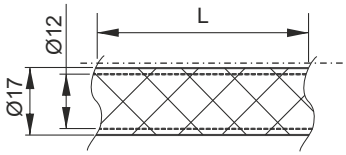
	L
PP0130	30
PP0180	80
PP01120	120

Recommended for vertical tanks

Spare part code

PP01**

Flexible plastic pipe



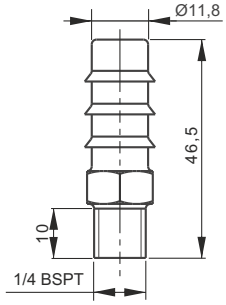
Weight: 0,18 Kg/metre

Recommended as standard return pipe.
To be fixed with TR0112 pipe holder and cut at proper length.
To be ordered in metres.

Spare part code

SF12

Flexible plastic pipe holder for return line 1/4" BSPT



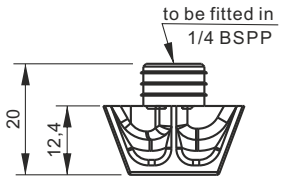
Weight: 0,01 Kg

Spare part code

TR0112

Relief valve return diffuser

To be mounted in cavity Tr



It reduces foam and noise when relief valve is laminating.
Recommended for all vertical mounting tanks.

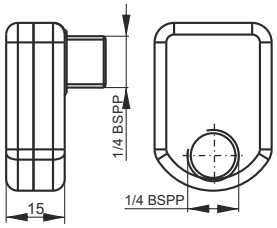
Weight: 0,01 Kg

Spare part code

SFEP01D

Suction filter

Filtration degree: 90 micron



Weight: 0,01 Kg

Spare part code

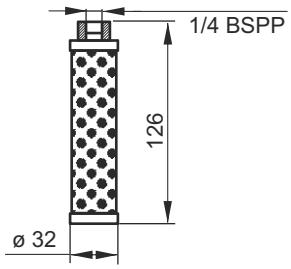
C34100100

SECTION E

TANKS ACCESSORIES

Return filter

Filtration degree: 90 micron

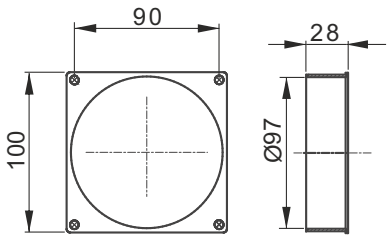


Suitable for tanks H and T

Weight: 0,09 Kg

Spare part code
C34200001

Steel tank adapter



Unpainted, to be welded on custom made tanks

Weight: 0,12 Kg

Spare part code
F80000012

EXTERNAL MANIFOLDS & ACCESSORIES

Basic blocks for modular valves **NG3 MICRO**, with parallel connection and side ports. They can be stacked modularly. Use simple 1/8 BSPP plugs to close the end P and T ports

Pilot operated check valves integrated into the NG3 MICRO modular block, eliminating the check valve module sandwiched between the base block and the directional valve

The **external hand pump** 4 or 8,8cc/stroke can be fitted between the central body and the NG3 MICRO modular blocks. The lever can be rotated 360 degrees to be placed in the most appropriate position

A full set of **accessories** is available to complete the power pack configuration

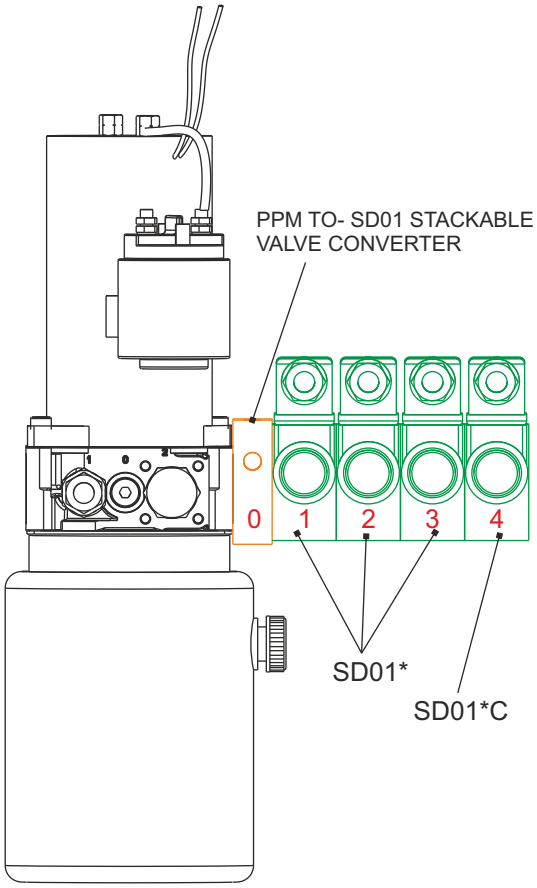
The PPM adaptor block for **stackable valves** SD01 and SD02 allows you to mount the range of bankable valves, a modular alternative to the NG3 MICRO directional valves

Which types of external manifold blocks can be mounted?
The central manifold exit face allows the mounting of manifold blocks fixed by 2x M8 bolts.
The first choice of external blocks is the NG3 MICRO system. Lateral exit ports modular base manifolds, spacer and 90° adaptor are available to modify dimensions and mounting positions for high flexibility.
To mount stackable directional valves the relevant adaptor plate PPM to SD01 (N50403007) is required. See section G technical tables for the relevant valve details.

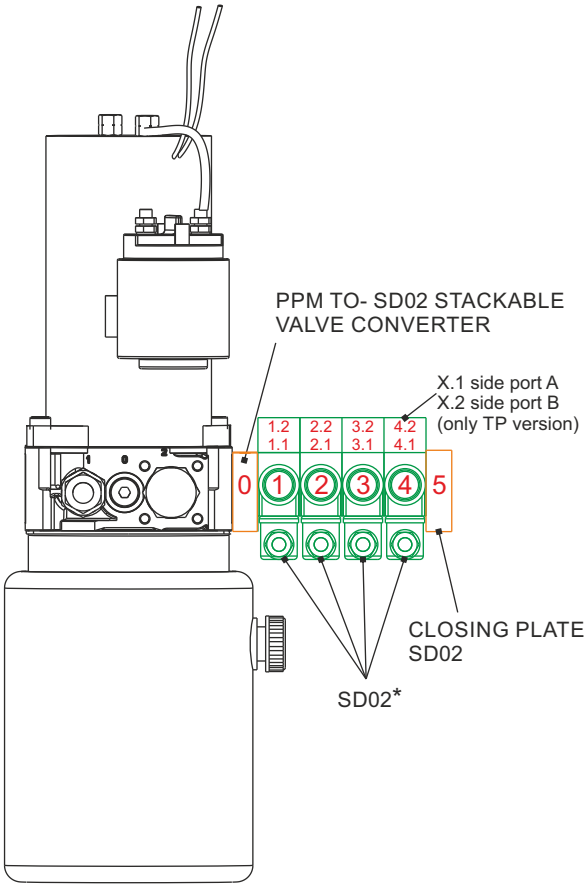
When do I need to mount the spacer block?
Whenever a big motor is mounted on the power pack, to avoid interference between the motor and external blocks and valves.
Normally M60403004 spacer must be mounted below the stack of NG3 MICRO manifolds whenever using any AC motor and with DC motors with frame 114.

EXTERNAL MANIFOLDS & VALVE MOUNTING EXAMPLES

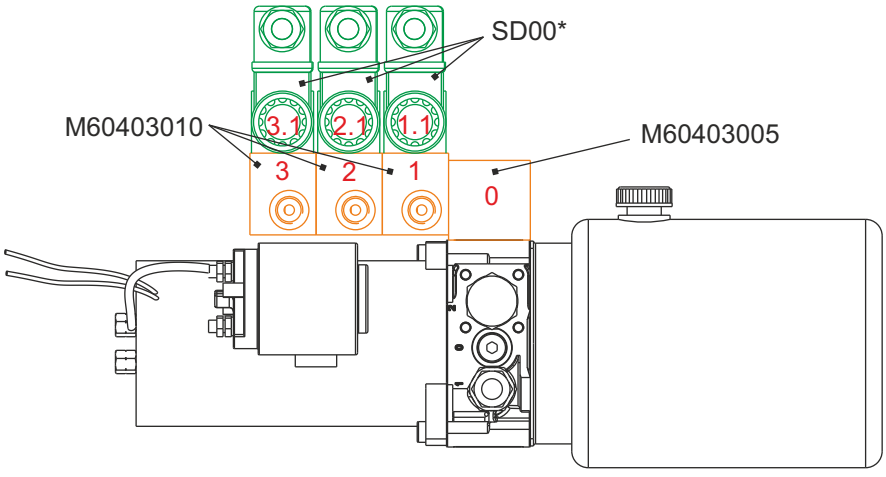
PPM + SD01 STACKABLE VALVES



PPM + SD02 STACKABLE VALVES



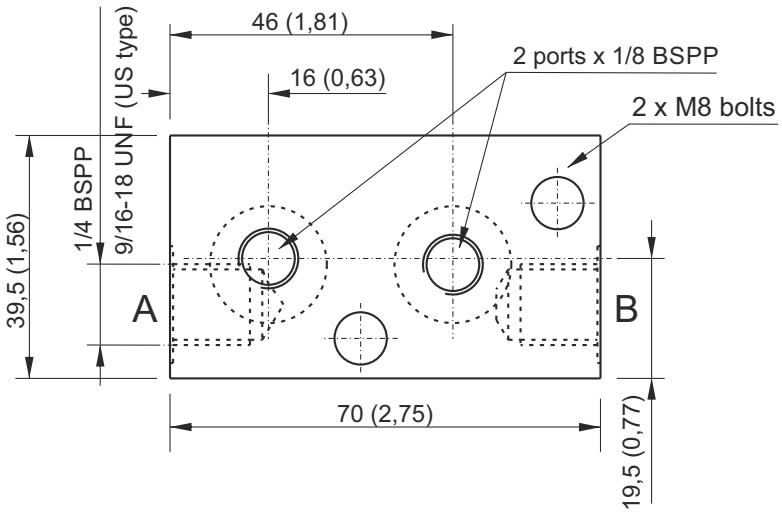
PPM + NG3 MICRO BLOCKS & VALVES



The micro powerpack external manifolds and valves are arranged following a stack level logic. Each stack is numbered as n, n.1, n.2, n.3,... where **n** is the basic manifold stack number, n.1 is the first valve mounted on top of manifold n, n.2 is the second one, mounted on top of n.1 one,...
See above self-explanatory drawings where manifolds are coloured in orange and valves in green. Stack levels are numbered in red.

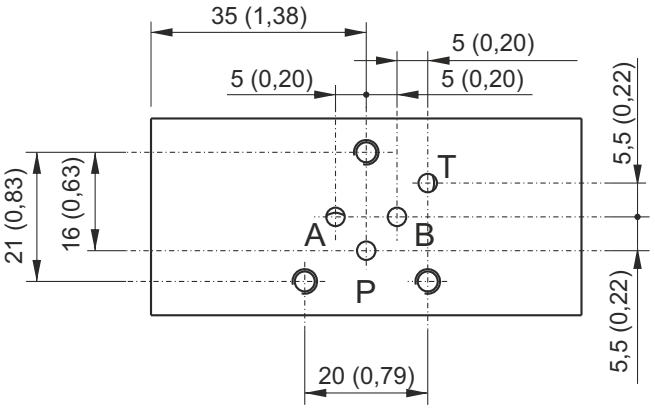
NG3 MICRO MODULAR MANIFOLDS. LATERAL PORTS

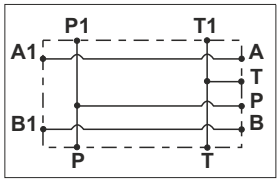
Dimensions in mm (inches)



Main features

Weight	0,21 kg
Fixing bolts	2xM8 tie-rods steel class 8.8 or above





Parallel connection	Spare part code
Lateral ports	M60403010
Lateral ports US execution	M60403010US

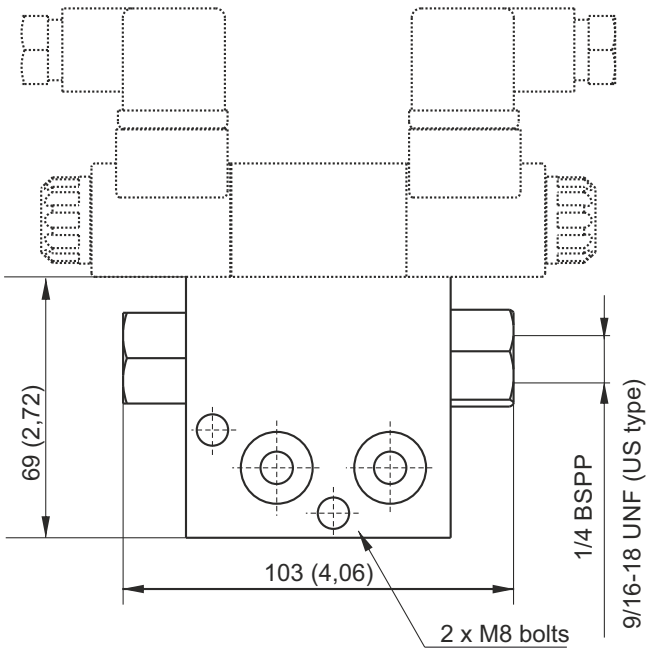
Note: to add external manifolds to PPM assembly code, just add their spare part codes at the end of PPM code. Ex: PPM-0,8 12DC-MB-J-K0,6-D/280-G-1,5L+**M60403004**+**M60403010**

The NG3 micro valve attachment is on motor side.

Recommended tightening torque for M8 bolts: 16 Nm. Attention! Do not use tie rods with steel class less than 8.8.

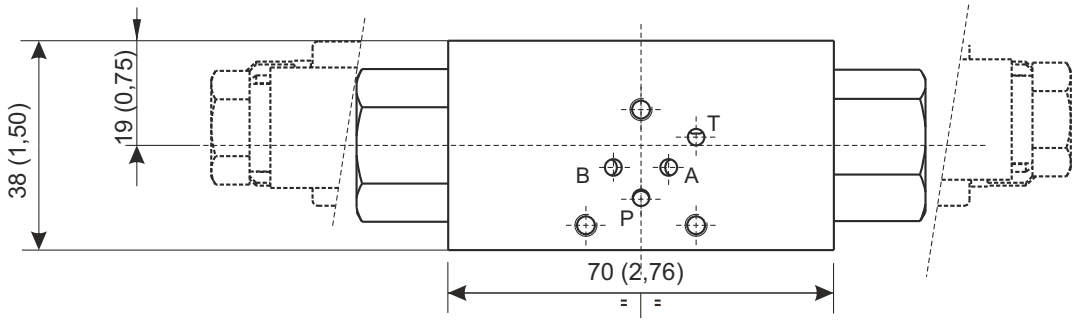
NG3 MODULAR MANIFOLD WITH INTEGRAL PILOT OPERATED CHECK VALVES

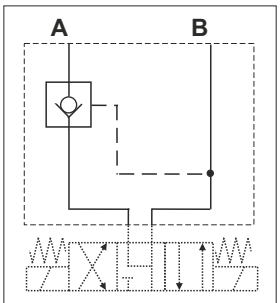
Dimensions in mm (inches)



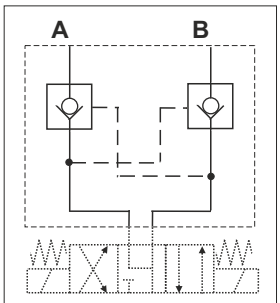
Main features

Weight	0,26 kg
Fixing bolts	2xM8 tie-rods steel class 8.8 or above

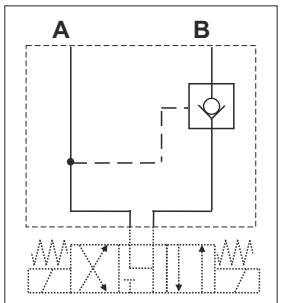




Spare part code
M60413002
M60413002US*



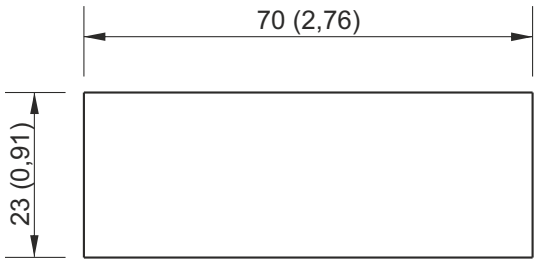
Spare part code
M60413001
M60413001US*



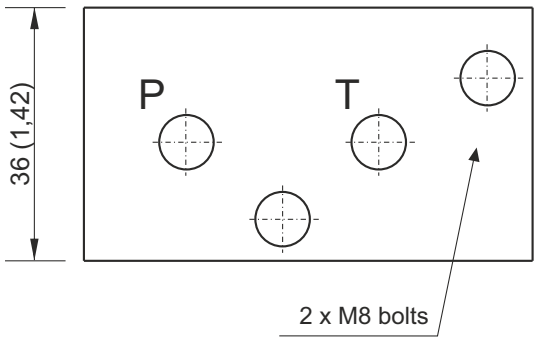
Spare part code
M60413003
M60413003US*

*: US execution with 9/16-18UNF SAE06 exit ports
Code does not include the NG3 valve
Recommended tightening torque for M8 bolts: 16 Nm. Attention! Do not use tie rods with steel class less than 8.8.

SPACER ELEMENT 23MM



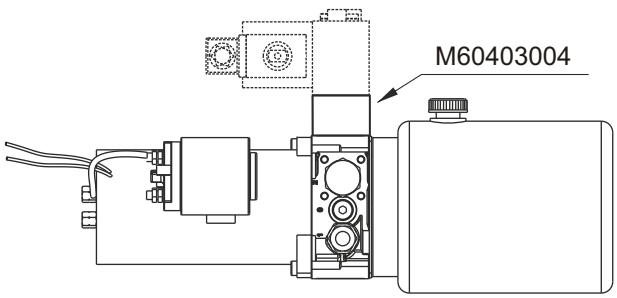
Dimensions in mm (inches)

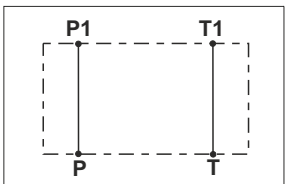


Main features

Weight	0,14 Kg (0,31lb)
Fixing bolts	2xM8 tie-rods steel class 8.8 or above

Mounting example





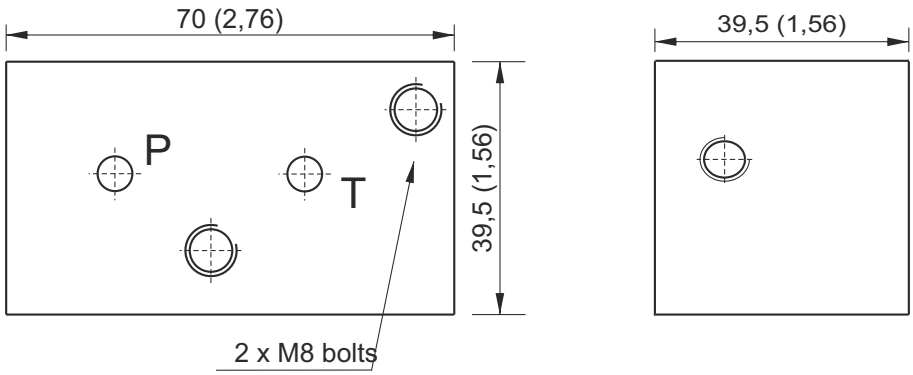
Spare part code
M60403004

Attention! Do not use tie rods with steel class less than 8.8.

SECTION F

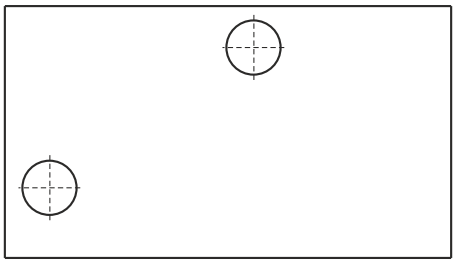
90° ROTATION MANIFOLD 39,5MM

Dimensions in in mm (inches)

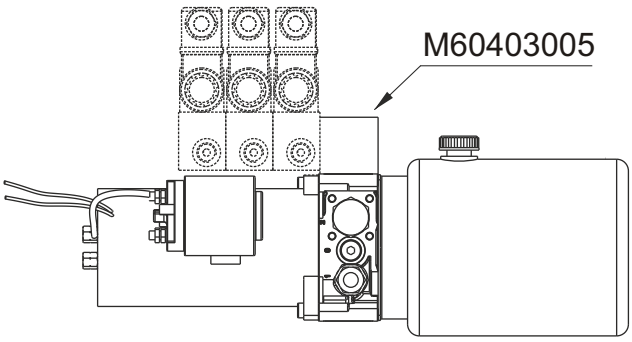


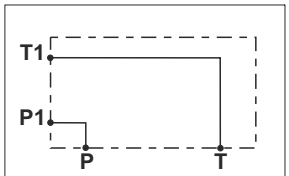
Main features

Weight	0,26 kg (0,57lb)
Fixing bolts	2xM8 tie-rods steel class 8.8 or above



Mounting example

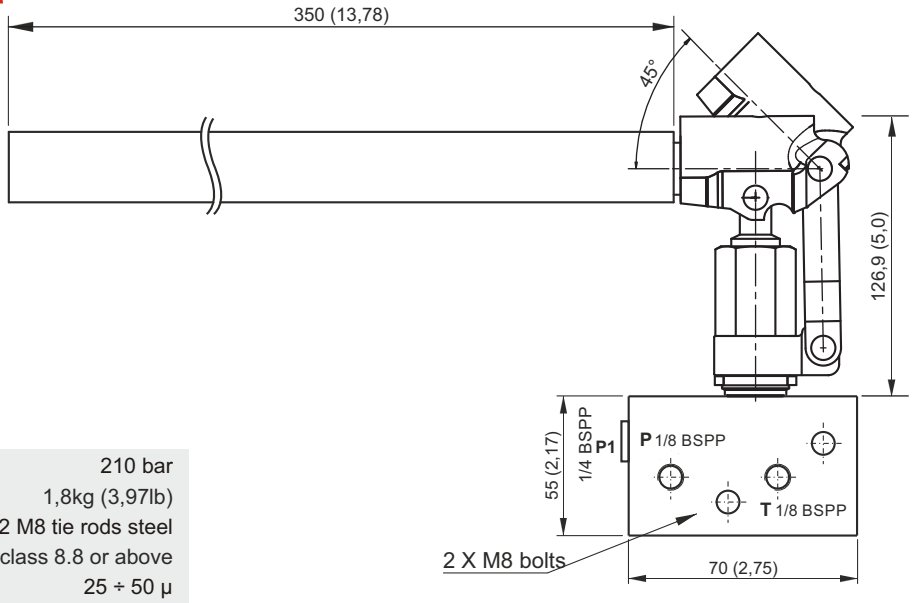




Spare part code
M60403005

Recommended tightening torque for M8 bolts: 16 Nm.
Attention! Don't use tie rods with steel class less than 8.8.

PM09 HAND PUMP MODULAR MANIFOLD



Dimensions in mm (inches)

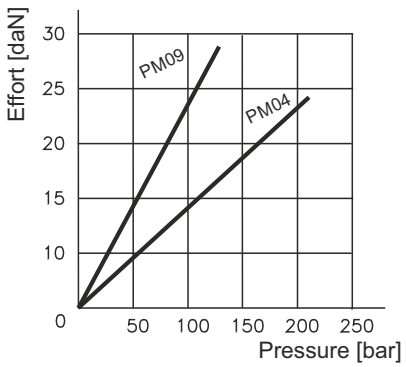
Main features

Max pressure	210 bar
Weight	1,8kg (3,97lb)
Fixing bolts	2 M8 tie rods steel class 8.8 or above
Filtration degree	25 ÷ 50 µ
Temperature range	-20 ÷ +70°C

Block thickness: 39mm (1,54)

Effort (daN)

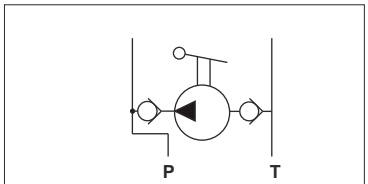
operating on the end of the standard lever



Spare part code without block

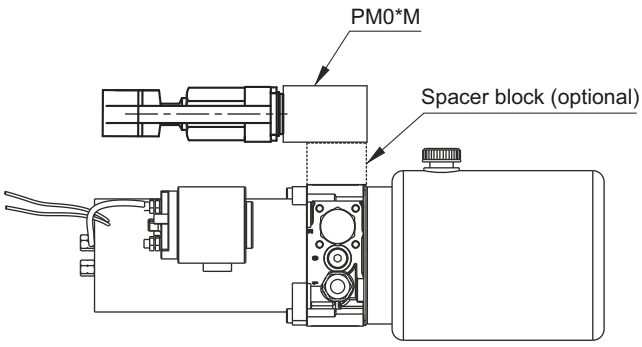
CARTPM04L — **hand pump cartridge 4 cc 7/8-14 UNF + lever**

CARTPM09L — **hand pump cartridge 8,8 cc 7/8-14 UNF + lever**



Assembly code	Displacement cc/stroke
PM04M	4
PM09M	8,8

Mounting example



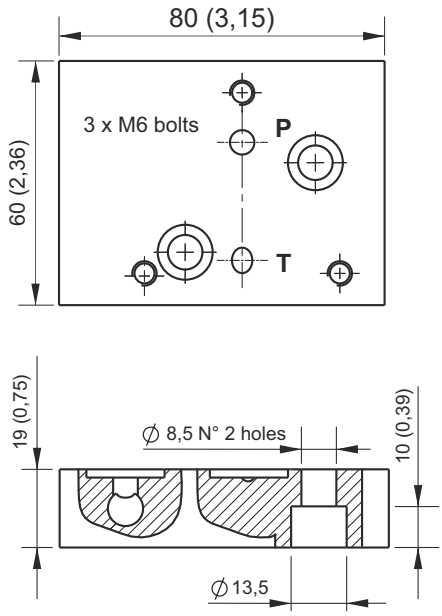
Recommended tightening torque for M8 bolts: 16 Nm. Attention! Do not use tie rods with steel class less than 8.8.

SECTION F

ADAPTER PLATE

Dimensions in mm (inches)

PPM TO SD01 STACKABLE VALVE CONVERTER (necessary to mount SD01 stackable valves)

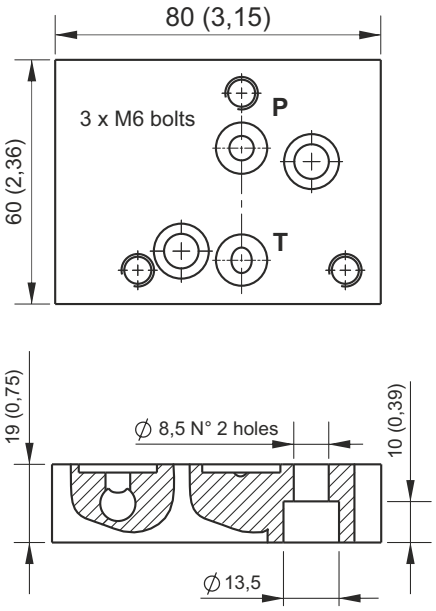


Fixing bolts: 2 bolts M8x20 steel class 8.8 or above
Weight: 0,22 Kg

Spare part code
N50403007

Dimensions in mm (inches)

PPM TO SD02 STACKABLE VALVE CONVERTER (necessary to mount SD02 stackable valves)



Fixing bolts: 2 bolts M8x20 steel class 8.8 or above
Weight: 0,22 Kg

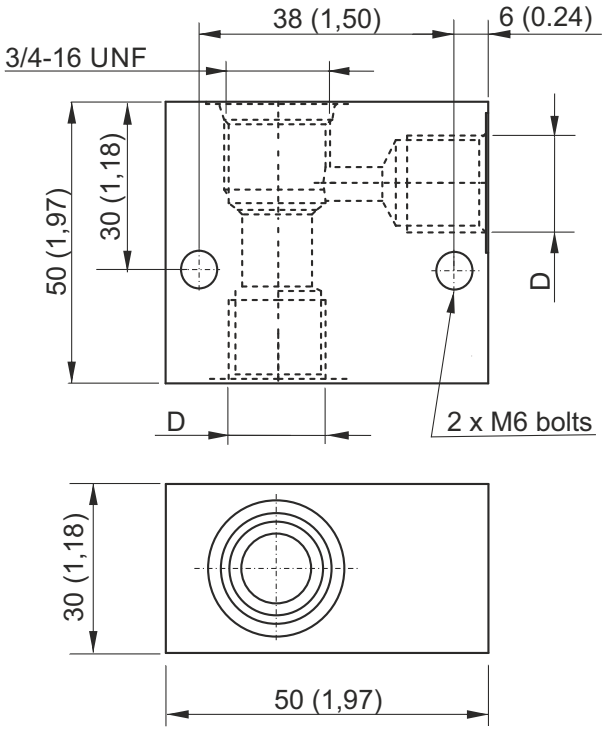
Spare part code
N50403007DN

Recommended tightening torque for M8 bolts: 16 Nm.
Attention! Do not use tie rods with steel class less than 8.8.

ACCESSORIES

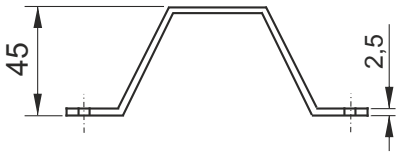
Dimensions in mm (inches)

In line mounting 3/4-16 UNF 2 way manifolds

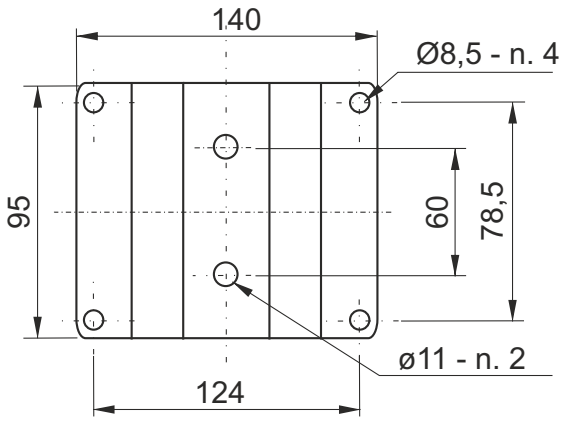


Spare part code	D	Weight
BFCSAE0801	1/4 BSPP	0,16 Kg
BFCSAE0802	3/8 BSPP	0,16 Kg

Foot mounting support



Weight: 0,35 Kg



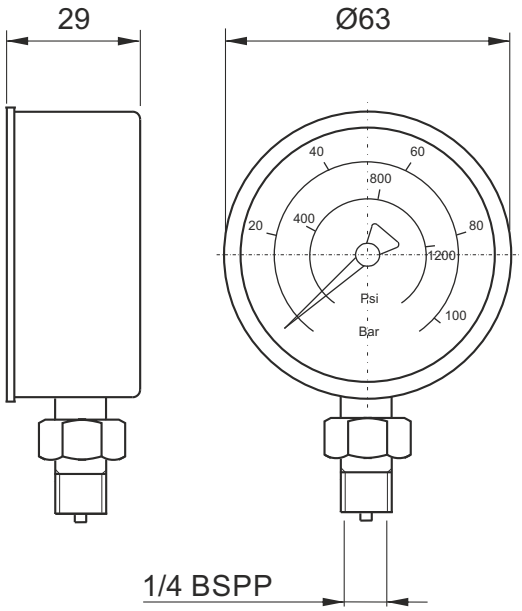
Spare part code
E60543003

SECTION F

ACCESSORIES

Pressure gauge

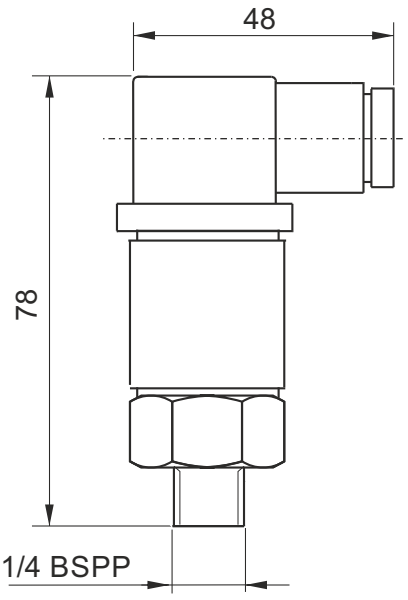
Protection degree	IP 65
Thermal drift	±0,04%/1K a 20°C
Weight	0,206 Kg
Static working pressure	75% end of scale
Peak working pressure	end of scale
Working temperature	-10 ÷ +60°C
Precision class	cl. 1.6 EN837-1



Spare part code	
MIR63* **	***:max pressure in bar (60, 160, 250, 315 bar)

Pressure switch

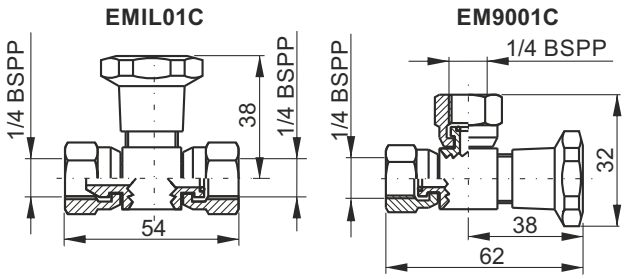
Protection degree	IP 65
Hysteresis	15 ÷ 25%
Weight	0,05 Kg
Max load	0,5A a 250VAC
Working temperature	-25 ÷ +85°C
Switching accuracy	±4% end of scale at 20°C
Electric switch	NA / NC



Spare part code	
F401* **	***:max pressure in bar (050, 100, 200, 400 bar)

ACCESSORIES

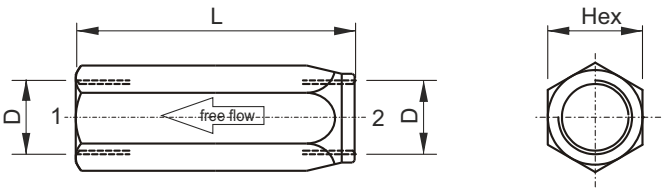
Gauge isolator F-F



Weight: 0,14 Kg. Max working pressure: 400 bar

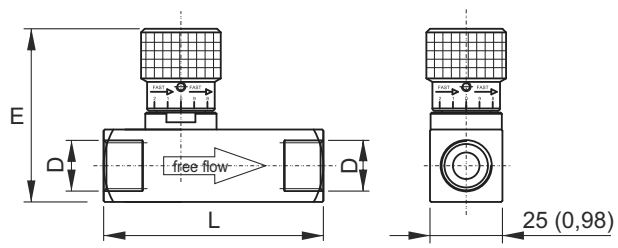
Spare part code
EM9001C / EMIL01C

In-line unidirectional check valve



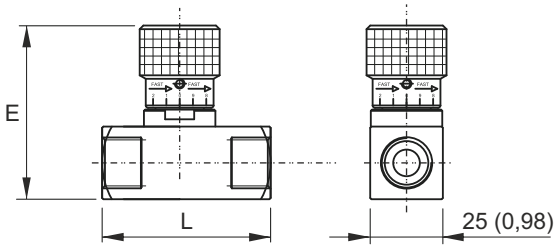
Spare part code	D	Ch	L	Weight
VUR01C	1/4 BSPP	19	55	0,10 kg
VUR02C	3/8 BSPP	24	65	0,18 kg
VURSAE06C	9/16-18UNF	19 (0,75)	58 (2,28)	0,10 kg (0,22 lb)

In-line unidirectional flow control valve



Spare part code	D	E	L	Weight
STU01	1/4 BSPP	68	66	0,34 kg
STU02	3/8 BSPP	68	77	0,36 kg
STUSAE06	9/16-18UNF	68 (2,68)	70,5 (2,78)	0,38 kg (0,84 lb)

In-line bidirectional flow control valve



Spare part code	D	E	L	Weight
STB01	1/4 BSPP	68	54	0,29 kg
STB02	3/8 BSPP	68	54	0,27 kg
STBSAE06	9/16-18UNF	68 (2,68)	54 (2,13)	0,30 kg (0,66 lb)

NOTES

EXTERNAL VALVES

Electrical valves bankable: the alternative solution to reduce weight and size of the mini-units. The port of use A and B are threaded directly on the valve body

Electrical valves NG3 MICRO: the optimal solution for high performance with compact extra dimensions. Each valve requires a modular block to be mounted

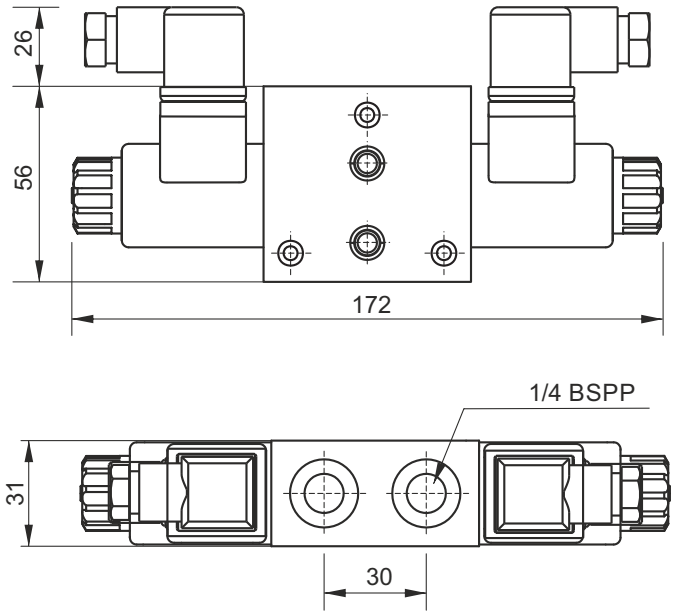
Cartridge valves mounted in manifold blocks: the lightweight and economical solution

Why aren't NG6 (cetop 3) valves available?
The range of micro powerpack is designed to have weight, size and cost reduced. The directional valves NG6 (cetop3) are designed for flow rates 10 times higher than those micro powerpacks and, despite their enormous spread all over the world, are now supplanted directional valves with factors of small footprint, high performance and energy saving, as our MICRO NG3 valves that offer the best weight / size. Each valve is 31mm high, it can create, for example, a battery of valves 7 in just 217 mm. Using valves CETOP 3 the same size would double. MICRO NG3 valves are currently available with 12V or 24V DC coils.

Is it possible to manufacture special manifold blocks with special valves combinations for specific applications?
Certainly. In the case where the quantities justify the investment of design and implementation. Please consult our technical department.

Which coils and connectors do I select for the spool valves?
NG3 MICRO valves SD00* series are planned to be driven by DC coils only. Stackable valves SD01* series use DC or RAC M120 series coils. When choosing a RAC coil, a rectifying bridge connector must be chosen (KA132**R*****). A standard KA13200000 connector must be always used with DC coils.

STACKABLE DIRECTIONAL SOLENOID VALVES



Main features

Max pressure	250 bar
Max pressure on T port	210 bar static, 140 bar dynamic
Max flow	20 l/min
Weight	0,89 Kg (1 solenoid) 1,09 Kg (2 solenoid)
Fixing bolts	3 tie-rods TCEI M6. 6 Nm torque. 10.9 class steel or better
Coil insulation	Class H
Electric connection	DIN 43650-A / ISO 4400
Protection class	IP 65 / DIN 40050
Duty cycle	ED 100%
Voltage required	+/- 10% nominal voltage
Emergency	included as standard
Standards	EN50081-1 / EN50082-2 (89/336 CEE electromagnetic comp.) 73/23/CEE / 96/68/CEE (low voltage)
Operating temperature	-20°C +80°C

Spare part code

SD01 — **Stackable directional solenoid valve**

A2 — **Spool and scheme:** see side table

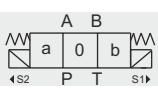
24DC — **Supply voltage:** see G050 table

- — **Position type:**

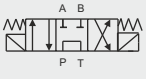
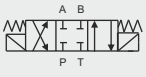
- = intermediate
C = top closed with P and T closed

Spool

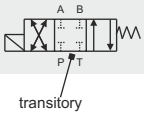
Code



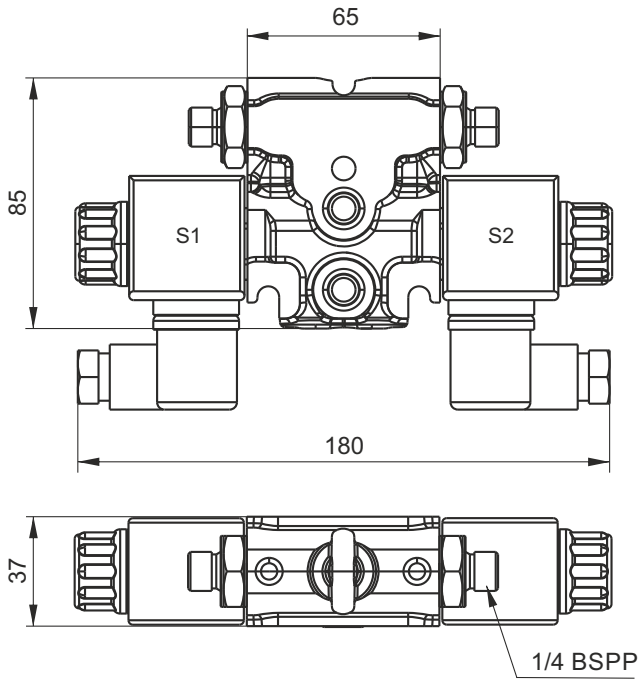
Double solenoid

A2	
B2	
C2	
E2	

Single solenoid

A11C	

STACKABLE MODULAR DIRECTIONAL SOLENOID VALVES WITH REAR PORTS



Options

Description	Spare part code
Closed plate, to be used as the last element	SD02TOP
Kit 3 tie-rods + nut M8 8.8 (x = number of elements)	SD020x

Main features

Max pressure	250 bar
Max pressure on T port	50 bar
Max flow	25 l/min
Weight	1,67 Kg (1 solenoid) 1,37 Kg (2 solenoid)
Internal leakage	0,02 l/min at 200bar
Fixing bolts	3 tie-rods TCEI M8. 15 Nm torque. 8.8 class steel or better
Coil insulation	Class H
Electric connection	DIN 43650-A / ISO 4400
Protection class	IP 65 / DIN 40050
Duty cycle	ED 100%
Voltage required	+/- 10% nominal voltage
Emergency	included as standard
Standards	EN50081-1 / EN50082-2 (89/336 CEE electromagnetic comp.) 73/23/CEE / 96/68/CEE (low voltage)
Operating temperature	-20°C +80°C

Spare part code

SD02 — **Stackable modular directional solenoid valve**

E2 — **Spool and scheme:**
see side table

RP — **Options:**
- = free outputs
RP = ouputs with piloted check valves (only spool E2 and C2)

24DC — **Supply voltage:**
see G050 table

Spool

Code	
	A B a 0 b S2 P T S1

Double solenoid

A2	A B P T
B2	A B P T
C2	A B P T
E2	A B P T

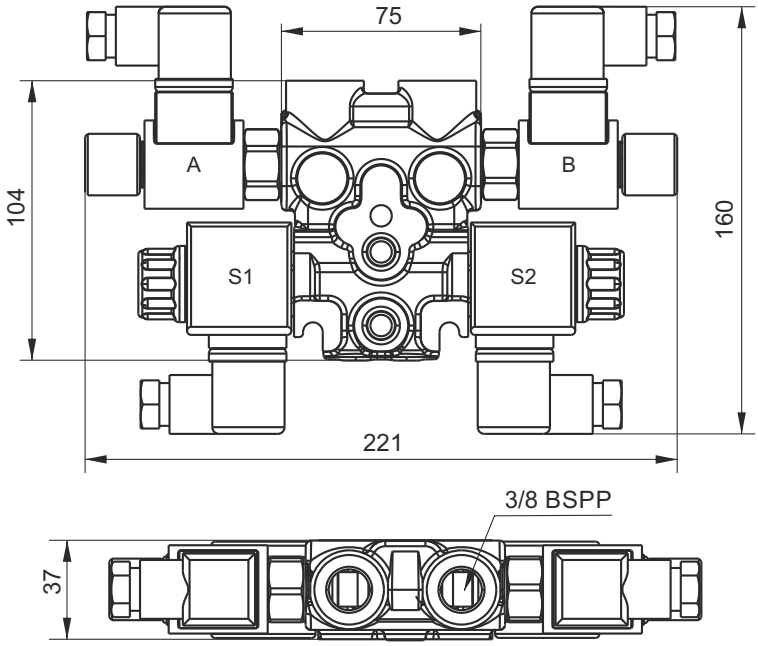
Single solenoid

A11CHF	A B P T

transitory

Opzione RP	A B
Codice	a 0 b P T

STACKABLE SOLENOID VALVES WITH 3/4-16UNF CAVITY FOR ADDITIONAL VALVES



Options

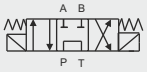
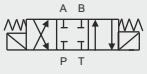
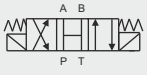
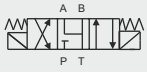
Description	Spare part code
Closed plate, to be used as the last element	**SD02TOP**
Kit 3 tie-rods + nut M8 8.8 (x = number of elements)	**SD020x**

Main features

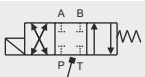
Max pressure	250 bar
Max pressure on T port	50 bar
Max flow	25 l/min
Weight	2,38 Kg (1 solenoid) 2,08 Kg (2 solenoid)
Internal leakage	0,02 l/min at 200bar
Fixing bolts	3 tie-rods TCEI M8. 15 Nm torque. 8.8 class steel or better
Coil insulation	Class H
Electric connection	DIN 43650-A / ISO 4400
Protection class	IP 65 / DIN 40050
Duty cycle	ED 100%
Voltage required	+/- 10% nominal voltage
Emergency	included as standard
Standards	EN50081-1 / EN50082-2 (89/336 CEE electromagnetic comp.) 73/23/CEE / 96/68/CEE (low voltage)
Operating temperature	-20°C +80°C

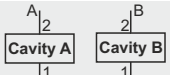
Spool

Double solenoid

A2	
B2	
C2	
E2	

Single solenoid

A11C	

Cavity option	
Code	

Spare part code

SD02 — **Stackable modular directional solenoid valve + cavity 3/4-16UNF for additional valves**

E2 — **Spool and scheme:**
see side table

TP — **Version:**
TP = parallel ports
with 3/4-16 UNF cavity

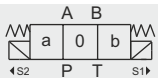
24DC — **Supply voltage:**
see G050 table

AR24DC — **Cavity A:**

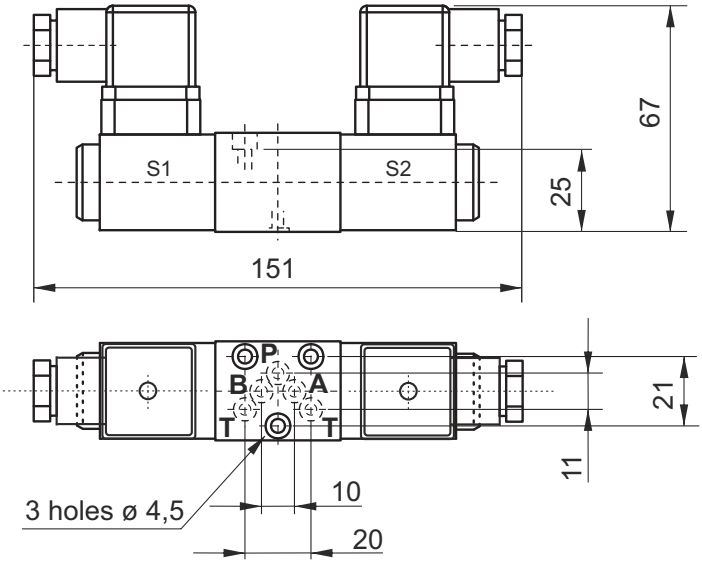
X = open cavity
L = closed plug
ARxx = valve 2/2 NC (xx = voltage)
S = check flow bidirectional valve

AR24DC — **Cavity B:**

X = open cavity
L = closed plug
ARxx = valve 2/2 NC (xx = voltage)
S = check flow bidirectional valve

Code	

NG3 MICRO DIRECTIONAL SOLENOID VALVES



Main features

Max pressure	315 bar
Max pressure on T port	100 bar
Max flow	15 l/min
Weight	0,7 kg (2 solenoid) 0,55 kg (1 solenoid)
Internal leakage	< 0,01 l/min at 200bar
Fixing bolts	3 TCEI M4x30. 2,8Nm torque 10.9 class steel or better
Coil insulation	Class H
Electric connection	DIN 43650-A / ISO 4400
Protection class	IP 65 / DIN 40050
Duty cycle	ED 100%
Voltage required	+/- 10% nominal voltage
Emergency	included as standard
Standards	EN50081-1 / EN50082-2 (89/336 CEE electromagnetic comp.) 73/23/CEE / 96/68/CEE (low voltage)

Spare part code

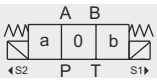
SD00 — **NG3 micro directional solenoid valve**

A2 — **Spool and scheme:** see side table

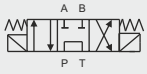
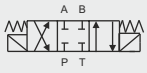
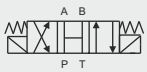
24DC — **Supply voltage:** see G050 table

- — **Options:** - = std

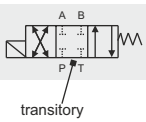
Spool

Code	
	

Double solenoid

A2	
B2	
C2	
E2	

Single solenoid

A11C	

COIL FOR EXTERNAL VALVES

M100

M120

M630/M631

M160

CE

Supply voltage [V]	Assembly code	Coil type	Spare part code	Spare connector code	Holding power [W]	Duty charge ED [%]	Prot. class	Weigh t [g]	Suitable for valve series
12DC	12DC_M100	DC	**M10040001**	KA132000B1	16W	100	H	121	SD00
24DC	24DC_M100	DC	**M10040002**	KA132000B1	16W	100	H	121	SD00
24AC	24RAC_M100	RC - needs external rectifying connector	**M10040002**	KA132R11B1	16W	100	H	121	SD00
12DC	12DC_M120	DC	**M12040001**	KA132000B1	22W	100	H	134	SD01
24DC	24DC_M120	DC	**M12040002**	KA132000B1	22W	100	H	134	SD01
24AC	24RAC_M120	RC - needs external rectifying connector	**M12040002**	KA132R11B1	22W	100	H	134	SD01
230AC	220RAC_M120	RC - needs external rectifying connector	**M12040005**	KA132R13B1	22W	100	H	134	SD01
12DC	12DC_M630	DC	**M6306012**	KA132000B1	18W	100	H	130	SD02
24DC	24DC_M630	DC	**M6306024**	KA132000B1	18W	100	H	130	SD02
24AC	24AC_M631	RC with integrated rectifying bridge	**M6316024**	KA132000B1	18W	100	H	130	SD02
115AC	115AC_M631	RC with integrated rectifying bridge	**M6316115**	KA132000B1	18W	100	H	130	SD02
230AC	230AC_M631	RC with integrated rectifying bridge	**M6316230**	KA132000B1	18W	100	H	130	SD02
12DC	12DC_M160	DC	**M16040001**	KA132000B1	26W	100	H	190	SD02*HF
24DC	24DC_M160	DC	**M16040002**	KA132000B1	26W	100	H	190	SD02*HF
24AC	24AC_M160	RC - needs external rectifying connector	**M16040002**	KA132R11B1	26W	100	H	190	SD02*HF
115AC	115AC_M160	RC - needs external rectifying connector	**M16040004**	KA132R12B1	26W	100	H	190	SD02*HF
230AC	230AC_M160	RC - needs external rectifying connector	**M16040005**	KA132R13B1	26W	100	H	190	SD02*HF

Other voltages and electric connectors types (Amp Junior, flying leads,...) available on request.
Inrush power consumption can be up to 3,5 times higher than the holding one.
Standard electric connector: DIN 43650-A / ISO 4400. Coil protection class: IP65.

follow us:

Hydronit®

via Pastrengo 62
20814 Varedo (MB), Italia
☎: +39 0232 0625 145
+39 0362 1841 210
: +39 0362 1841 214
@ : info@hydronit.com
www.micropowerpacks.com
www.hydronit.com

Hydronit communicates only with eco-friendly paper

Printed in Italy. Edition 2014-01EN