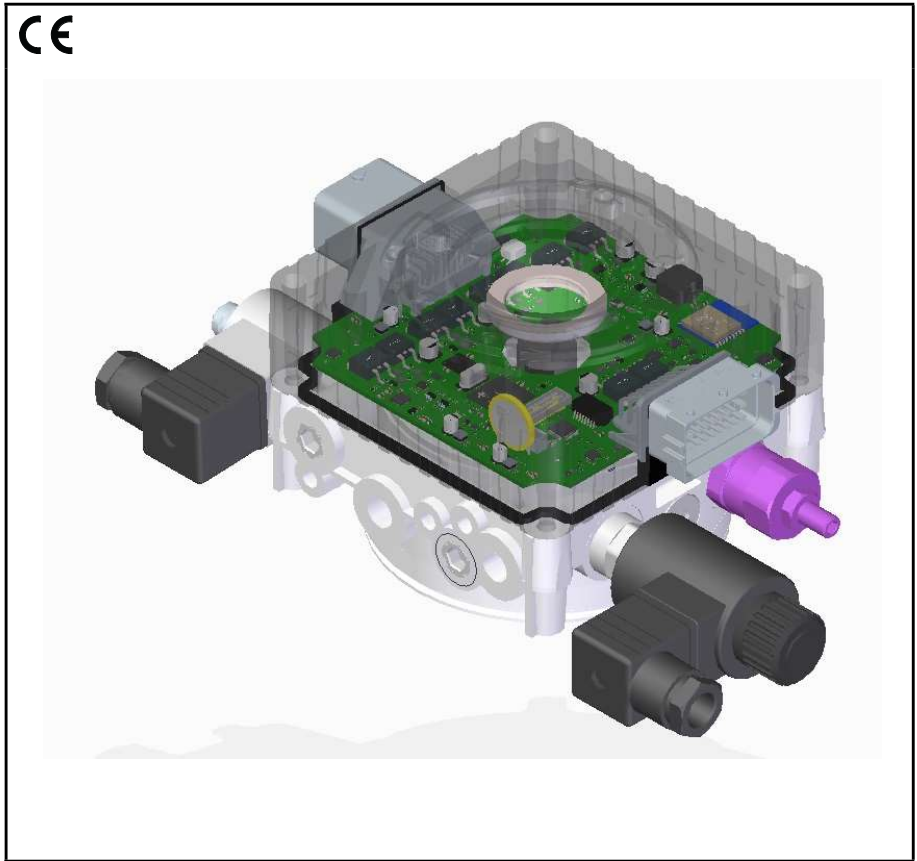


HPC02

M/DRAULICS SYSTEM

IEC 61508:2010 SIL 2
 Suited for requirements up to:
 PL d (ISO 13849-1:2015)
 AgPL d (ISO 25119:2018,
 DIN EN 16590:2014)
 32-bit TI RM48 processor
 32 inputs/outputs
 2 CAN interfaces
 Ethernet / WI-FI interface
 BT MESH interface
 Built-in three axis accelerometer
 9...60 V DC
 CODESYS 3.5
 P/Q hydraulic management
 Built-in pressure sensor
 Built in flow sensor

CE



HPC02: pressure compensated proportional flow regulator with on-board programmable PLC. This device is suitable in HYDRONIT minipowerpack. It allows multiple hydraulic scheme as well as the installation of Multiple type of electric motors and pumps. Can be installed on any HYDRONIT hydraulic power pack.

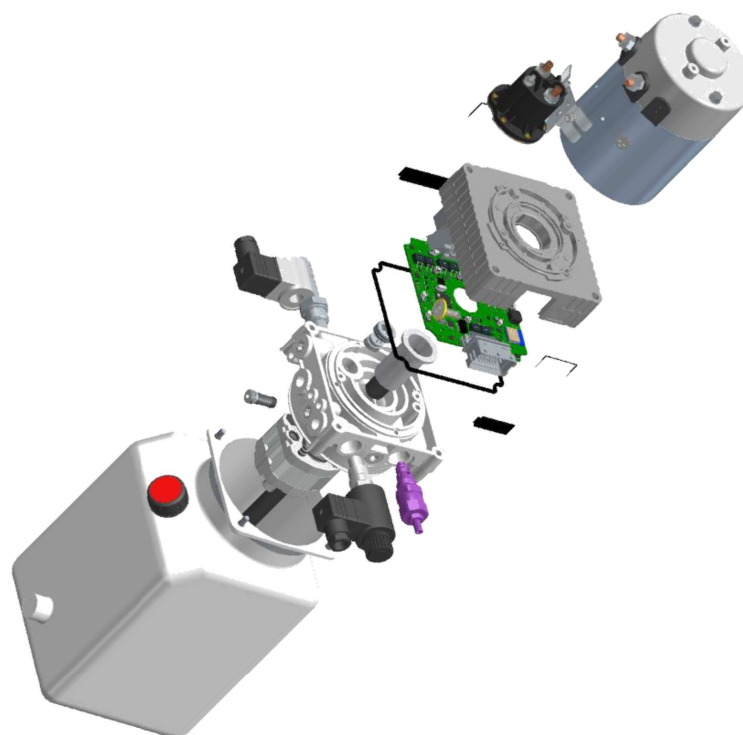
Technical data	Mechatronic P/Q device with built-in PLC as black box system_for the implementation of a centralised system design
Mechanical data	
Housing	closed, screened metal housing with screw fixing
Dimensions (H x W x D)	133 x 133 x 111 mm
Installation	within a compact hydraulic power pack
Connection	2 connector 56 poles, locked, mechanical reverse polarity protection
Weight	1.9 kg (without hydraulic components)
Housing/storage temperature	-20...85 °C / -40...85 °C
Max. perm. relative humidity	90 % (not condensing)
Protection rating	IP 55 / IP 65 (for inserted connectors with individually sealed cores and inserted M12 connectors/sealing caps)
Electrical data	
Input/output channels total	32 (14 inputs / 18 outputs)
Inputs	configurable, with diagnostic capability 12 x Analog (0...10/32 V, 0...20 mA,) 2 x FRQ _{L/H} (≤ 30 kHz) 1 x Analog (0-20 mA) and HART protocol
Hydraulic data	Aluminium die-casted hydraulic collector with 3way-pressure compensated scheme. <ul style="list-style-type: none"> • Flow regulator – SAE 10 cavity • Pressure compensator – hydronit design • Pressure relief – SAE08 cavity • Other cavities – 3 x SAE08 (see scheme) • Compatible with Load Sensing directional valves

HPC02

Technical data

Mechatronic

HYDRAULIC POWER PACK with on-board programmable PLC



M/DRAULICS: brought to you by Xdraulics, a division of Hydronit

HPC02 is a mechatronic element which can be integrated in any HYDRONIT hydraulic power pack of the PPC series. With HPC02, an hydraulic power pack is able to fully manage a machine by the hydraulic and electronic point of view, without third party external PLC or electronic controllers. The freely programmable electronic controller is located on-board the hydraulic collector, where power, logic, and sensors are needed. Thus the hydraulic power pack offer a complete machine management in a compact powerful solution which is only 40mm thicker than a normal hydraulic power pack. The controller is suitable for safety related applications since is SIL2 compliant (as per EN 61508-3 directive).

The controller reads local sensors through analog ports, remote sensor through fieldbus and drives up to 14 solenoids for proportional or on-off valves. HPC02 integrates a set of sensors such as:

- 3 axis accelerometer, suitable for roll/pitch detection and vibrations
- Pressure sensor on pump' delivery
- Electric motor rotation sensor
- Oil temperature sensor

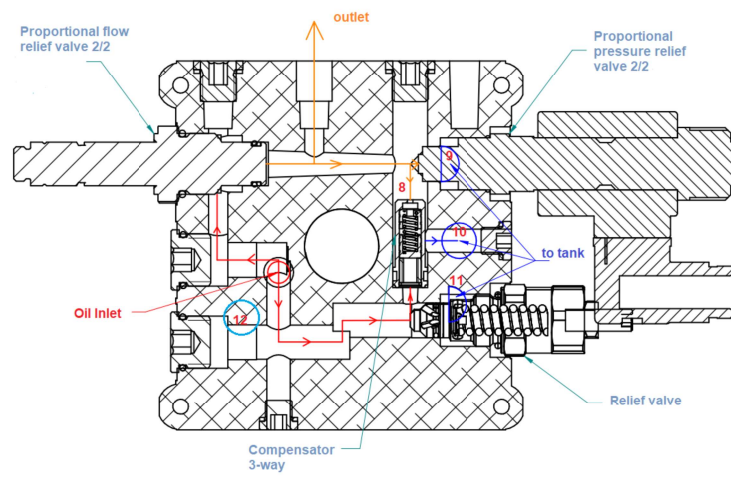
They can be used for preventive maintenance purposes, as well as for process. HPC02 integrates a well visible indicator LED for fast diagnostics of the system

HPC02

Technical data

Hydraulic

TYPICAL HYDRAULIC CIRCUIT PQ



HPC02-PQ: hydraulic functions explained

HPC02-PQ typical scheme allows a pressure compensated flow regulation of fluid. This technology allows consistent energy savings and stable speed regulation of hydraulic axis. With an additional proportional pressure relief valve, force/torque control is allowed as well.

Description of the function:
 A pump delivers oil through oil inlet (red) in the HPC02 hydraulic collector. Max pressure is limited by the Relief valve. If the "proportional flow valve 2/2" is closed, flow returns to tank through the pressure compensator-3way valve. The spring (8) in the compensator defines the minum regulated pressure of the system and it has to be considered an offset of the working pressure.
 If the proportional flow valve opens less than 100%, a regulated flow is delivered to the Load through further directional valves. The exceeding pump's flow is then returned to at the load pressure with relevant energy savings: the lower is the load, the lower is the pressure, then the energy request is "sensible to load".

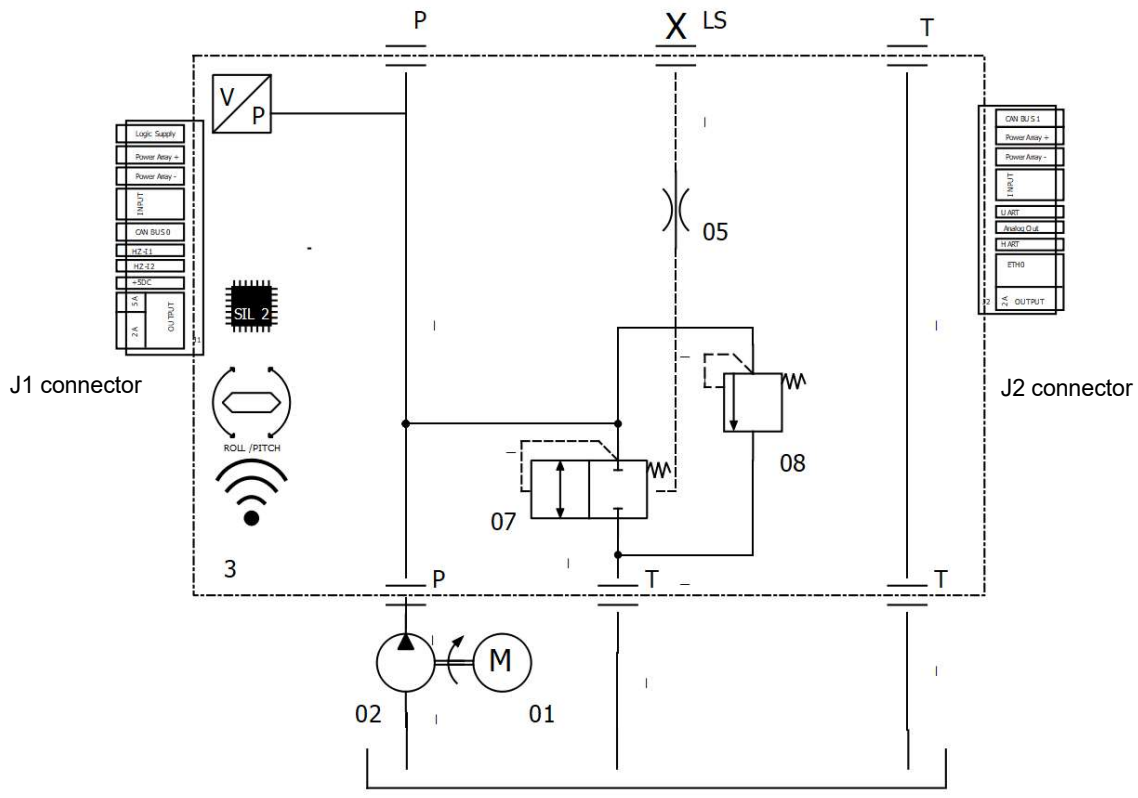
The Relief valve acts only if working pressure exceed its setting.

Other hydraulic schemes are available on request.

HPC02

Technical data

HYDRAULIC SCHEME LS in HPC02



Legenda HPC02

- 01 Electric Motor (not supplied)
- 02 Pump (not supplied)
- 03 PLC
- 05 Hydraulic dumper
- 07 Hydraulic pressure compensator valve
- 08 Hydraulic pressure limiter

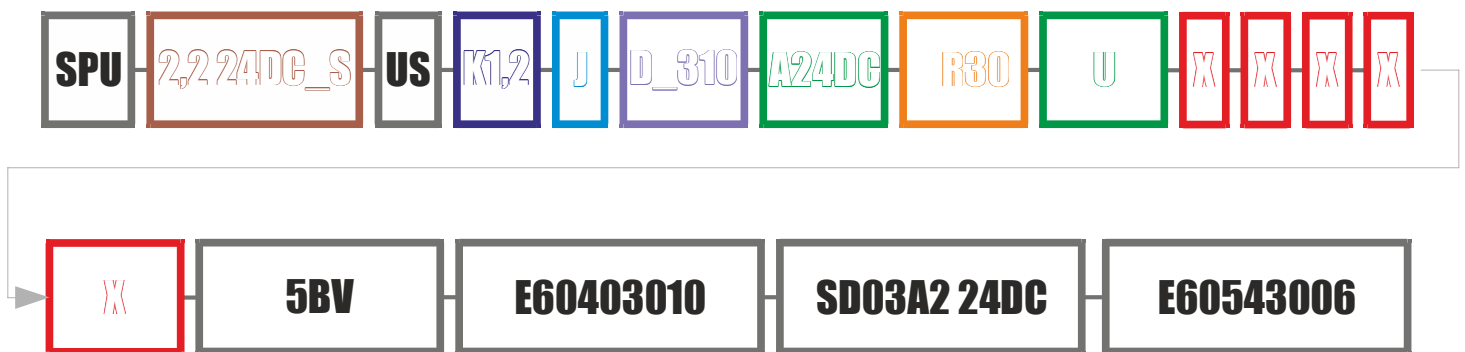
Mechatronic

CONFIGURATION and "speaking code"

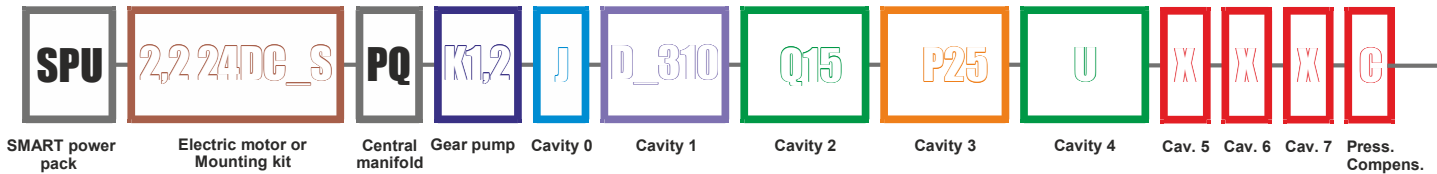
MIDRAULICS power pack: configuration

MIDRAULICS means Modular Intelligent Hydraulic Compact Power Pack. The HPC02 hydraulic collector is the central support of a wide number of accessories necessary to complete the hydraulic section of MIDRAULICS. The HPC02 needs to be completed with at least: Electric Motor, Hydraulic Pump, Hydraulic Reservoir and few valves in order to operate a basic function.

The following string describes an example of codification / ordering code of a complete MIDRAULICS, which includes several hydraulic valves and accessories.


Example

SMART POWER UNIT (MIDRAULICS) with a 2.2kW 24 VDC electric motor and integrated relay, high pressure pump 1,2cc rev
 Mechanic pressure relief valve maxxxxxx 310bar, check valve in cavity 1, Proportional Flow Regulator 30l/min,



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
3 24DC	24VDC 3000W
4 24DC	24VDC 4000W
2.5HD 12DC	12VDC 2500W
3HD 24DC	24VDC 3000W
4HD 24DC	24VDC 4000W

DC Motors Options

_T	thermal switch
_S	starter switch
_FP	fan cooler 1,6+4kW
_MC	plastic cover

AC 3 Phase Motors

EO.37AC 34 71	0,37kW S3 3 ph 4 poles
EO.55AC 34 71	0,55kW S3 3 ph 4 poles
EO.75AC 34 71	0,75kW S3 3 ph 4 poles
E1.1AC 34 80	1,1kW S3 3 ph 4 poles
E1.5AC 34 90	1,5kW S3 3 ph 4 poles
E2.2AC 34 90	2,2kW S3 3 ph 4 poles
E3.0AC 34 90	3kW S3 3 ph 4 poles
E4.0AC 34 100	4kW S3 3 ph 4 poles
E5.5AC 34 100	5,5kW S3 3 ph 4 poles
B14 7.5AC 34 112	7,5kW S3 3 ph 4 poles

AC Single Phase Motors

EO.37AC S4 71	0,37kW S3 1 ph 4 poles
EO.55AC S4 71	0,55kW S3 1 ph 4 poles
EO.75AC S4 80	0,75kW S3 1 h 4 poles
E1.1AC S4 90	1,1kW S3 1 ph 4 poles
E1.5AC S4 90	1,5kW S3 1 ph 4 poles
E2.2AC S4 90	2,2kW S3 1 ph 4 poles
E3.0AC S4 100	3kW S3 1 ph 4 poles

AC Motors Mounting Kits

XB14 71-0	B14 frame 71 + pump gr. 0
XB14 80-0	B14 frame 80 + pump gr. 0
XB14 71-1	B14 frame 71 + pump gr. 1
XB14 80-1	B14 frame 80 + pump gr. 1
XB14 90-1	B14 frame 80 + pump gr. 1
XB14 100-1	B14 frame 100/112 + p. gr. 1
X56C-0	Nema 56C + pump gr. 0
X56C-1	Nema 56C + pump gr. 1
XPU1401-0	pulley + pump gr. 0
XPU1401-1	pulley + pump gr. 1

Central Manifolds

UA	Universal A type with 3 lateral cavities
UB	Universal B type with 5 lateral cavities
U4	Universal 4 type for 4 way cartridge valves
UR	Universal R type for reversible pump

Central Manifolds Options

PQ	Pressure and flow proportional
-----------	--------------------------------

Gear Pumps

K0.2	0,26 cc/rev gr0
K0.4	0,38 cc/rev gr0
K0.6	0,64 cc/rev gr0
K0.9	0,89 cc/rev gr1
K1.2	1,27 cc/rev gr1
K1.6	1,66 cc/rev gr1
K2.1	2,17 cc/rev gr1
K2.7	2,8 cc/rev gr1
K3.2	3,3 cc/rev gr1
K3.7	3,8 cc/rev gr1
K4.2	4,3 cc/rev gr1
K5.0	5,1 cc/rev gr1
K6.0	6,0 cc/rev gr1
K7.9	7,9 cc/rev gr1
G9.8	9,8 cc/rev gr1

Gear Pumps Options

NL	double pump with hi-lo circuit
-----------	--------------------------------

High Pressure Gear Pumps

H1.2	1,2 cc/rev gr1
H1.7	1,7 cc/rev gr1
H2.2	2,2 cc/rev gr1
H2.6	2,6 cc/rev gr1
H3.2	3,2 cc/rev gr1
H3.8	3,8 cc/rev gr1
H4.2	4,3 cc/rev gr1
H4.7	4,7 cc/rev gr1
H6.0	6,0 cc/rev gr1
H7.4	7,4 cc/rev gr1

Low Noise Gear Pumps

S2.2	2,2 cc/rev low N gr1
S3.2	3,2 cc/rev low N gr1
S4.3	4,3 cc/rev low N gr1
S6.4	6,4 cc/rev low N gr1
S8.3	8,3 cc/rev low N gr1
S10	10,2 cc/rev low N gr1
S13	12,9 cc/rev low N gr1

Reversible Gear Pumps

R0.3	0,32 cc/rev revers. gr0
R0.5	0,49 cc/rev revers. gr0
R0.7	0,64 cc/rev revers. gr0
R0.9	0,88 cc/rev revers. gr0
R1.3	1,25 cc/rev revers. gr0
R1.5	1,54 cc/rev revers. gr0
R2.1	2,1 cc/rev revers. gr1
R2.6	2,6 cc/rev revers. gr1
R3.2	3,2 cc/rev revers. gr1
R4.3	4,3 cc/rev revers. gr1
R6.5	6,5 cc/rev revers. gr1

Cavity 0 Valves

J	check valve 3/4-16UNF
S	flow control valve
L	plug 3/4-16UNF
N	open plug with 1/4 BSPP open port

Cavity 0 options

MIR63'EM'	pressure gauge(*=bar max)+shut-off
F401'W'	pressure switch (*=bar max)

Cavity 1 and 4Valves

D_*	relief valve P (*= bar max)
XP	closed plug for relief valve cavity

Cavity 2 Valves (7/8 14 UNF)

A	NC 2/2 way poppet valve
B	NC 2/2 way poppet valve + emergency
Q	NO 2/2 way poppet valve
G	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

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 (7/8 14 UNF)

Q24	Proportional Flow Valve 24 l/min
Q15	Proportional Flow Valve 15 l/min
Q08	Proportional Flow Valve 08 l/min

Cavity 3 Valves

P08	NC 2/2 way poppet valve reverse flow
P15	NC 2/2 way poppet valve+em. reverse flow
P25	NO 2/2 way poppet valve+em. reverse flow
P35	NC 2/2 way double poppet valve+emerg.
G	closed plug
H	closed plug with 1/4 BSPP exit port

Cavity 5 - 6 - 7 - 8 - 9 Valves

1(04)	1 l/min pres. comp. flow cont. ø 12,7
1,5(04)	1,5 l/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)	10 l/min pres.comp.flow cont. ø 12,7
13(04)	13 l/min pres.comp.flow cont. ø 12,7
17(04)	17 l/min pres.comp.flow cont. ø 12,7
22(04)	22 l/min pres.comp.flow cont. ø 12,7
1(01)	1 l/min 1/4 BSPP p. comp. flow ctrl
1,5(01)	1,5 l/min 1/4 BSPP p. comp. flow
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)	10 l/min 1/4 BSPP p. comp. flow ctrl
13(01)	13 l/min 1/4 BSPP p. comp. flow ctrl
17(01)	17 l/min 1/4 BSPP p. comp. flow ctrl
22(01)	22 l/min 1/4 BSPP p. comp. flow ctrl
P01	1/4 BSPP plug
RETURN-MIT	suction/return line pipe
PP01370	suction/return line pipe
RF01	return line immersed filter

Standard mounting positioning rules:

- Filler cap tank side ports P and T
- Electric box AC motor side cavity 2
- Poles of DC motors and solenoid side cavity 2
- For horizontal mounting units, suction filter side mounting foot holes

Lacking any specific requests by the customer, all power units are supplied assembled according with these rules.

This page contains only most common codes and options.

For the full available range please check following pages.

Solenoid Valves Coils

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


5BV
E60403010
SD03A2 24DC
E60543006
Cavity 9-11-12
Tank & mounting style
External blocks
External valves
Accessories
Cavity 9 Flow Valves

1(01)	1 l/min 1/4 BSPP p. comp. flow ctrl
1.5(01)	1,5 l/min 1/4 BSPP p. comp. flow
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)	10 l/min 1/4 BSPP p. comp. flow ctrl
13(01)	13 l/min 1/4 BSPP p. comp. flow ctrl
17(01)	17 l/min 1/4 BSPP p. comp. flow ctrl
22(01)	22 l/min 1/4 BSPP p. comp. flow ctrl

Plastic Tanks

1.5L	1,5l square plastic
3L	3l square plastic
6L	6l square plastic
5M	5l square plastic
8M	8l square plastic
5P	5l round plastic
7P	7l round plastic
9P	9l round plastic
11P	11l round plastic

Steel Tanks

1.5A	1,5l cylindrical steel
2.5A	2,5l cylindrical steel
5B	5l cylindrical steel
10B	10l cylindrical steel
12B	12l cylindrical steel
10C	10l square steel
22C	22l square steel
3EV	3l square steel
7EV	7l square steel
8EV	8l square steel
15EV	15l square steel
20EV	20l square steel
30EV	30l square steel
F80000001	steel tank adapter

Tanks Options

V	vertical mounting
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External Blocks NG3 PPM

M60403004	23mm spacer subplate
M60403005	90° rotation manifold
M60403010	Ng3 MICRO parallel block lateral ports
M60413001	Ng3 MICRO manifold with p.o. check v.

External Blocks NG6 (cetop3) PPC

E60403004	28mm spacer subplate
E60403002	49mm 90° rotation manifold
E60403005DF	90° rotation manifold double face
E60403039	additional single acting manifold
E60403001	Ng6 (Cetop3) parallel block rear ports
E60403010	Ng6 (Cetop3) parallel block lateral ports
E60403011	Ng6 (Cetop3) series block lateral ports
E60413001	Ng6 (Cetop3) manifold with p.o. check v.
E60403020	spin-on return line filter block
E60403025	filter in pressure block
PM04	hand pump 4 cc/stroke manifold block
PM09	hand pump 8,8 cc/stroke manifold block
E60403030	SAE08 2-way cartridge manifold block
E60403031	SAE08 3-way cartridge manifold block

Blocks Options

/US	SAE06 exit ports for North American market
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Piastre Di Adattamento

E60403006	adapter PPC-SD01
E60403006DN	adapter PPC-SD02
E60403008M	adapter PPC-PPM

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 buttons control box
P0202	remote 4 buttons control box

E60543006	foot mounting support
E60543007	foot mounting support - tall type
VU01C	in-line check valve 1/4 BSPP
VU02C	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

SD02E2LS	Stackable directional valve ON-OFF with LS port
SDP2E2LS	Stackable directional proportional valve with LS
SDP2E2LSCP	NG3 MICRO directional valve 4/3 closed center
SD02C2RP	Stackable dir. valve 4/3 H center + p.o. check valves
SD02E2RP	Stackable dir. valve 4/3 center A-B to T + p.o. check valves
SD02A2TP	Stackable dir. valve 4/3 P to T + cavity SAE08
SD02B2TP	Stackable dir. valve 4/3 closed center + cavity SAE08
SD02C2TP	Stackable dir. valve 4/3 H center + cavity SAE08
SD02E2TP	Stackable dir. valve 4/3 A-B to T + cavity SAE08
SD03A11C	NG6 (cetop 3) directional valve 4/2
SD03A2	NG6 (cetop 3) directional valve 4/3 center P to T
SD03B2	NG6 (cetop3) directional valve 4/3 closed center
SD03C2	NG6 (cetop3) directional valve 4/3 H center
SD03E2	NG6 (cetop3) directional valve 4/3 center A-B to T
SDP03E2	NG6 (cetop3) proportional directional valve 4/3 A-B to T

Solenoid Directional Valves Coils

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

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

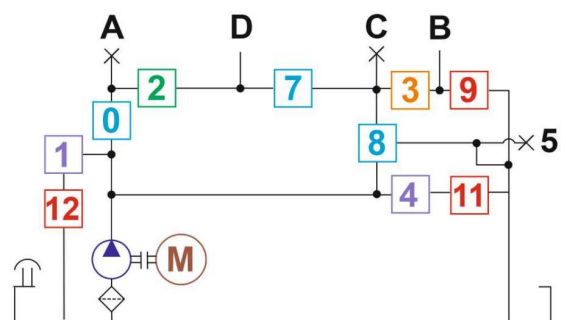
Hand Operated Directional Valves

HD03A1	NG6 (cetop3) manual dir. valve spring centered, P to T
HD03A2	NG6 (cetop3) manual dir. v. spring centered closed center
HD03A3	NG6 (cetop3) manual dir. valve spring centered, H center
HD03A10	NG6 (cetop3) manual dir. valve spring centered, A-B to T
HD03D1	NG6 (cetop3) manual dir. valve with detent, P to T
HD03D2	NG6 (cetop3) manual dir. valve with detent, closed center
HD03D3	NG6 (cetop3) manual dir. valve with detent, H center
HD03D10	NG6 (cetop3) manual dir. v. with detent, center A-B to T

Sandwich Modular Valves

E60423001	NG6 (cetop3) sandwich modular valve with relief valves
E60433001	NG6 (cetop3) sandwich modular valve with throttle valves

Reference hydraulic scheme PQ central manifold
 (see section B for all central manifolds executions)

Hydraulic scheme


AC & DC electric motors

Section A

DC motors

0,15 12DC_T	12VDC motor - 150W - Ø 80 + thermal switch
0,15 24DC_T	24VDC motor - 150W - Ø 80 + thermal switch
0,3 12DC_T	12VDC motor - 300W - Ø 80 + thermal switch
0,3 24DC_T	24VDC motor - 300W - Ø 80 + thermal switch
0,5 12DC	12VDC motor - 500W - Ø 80
0,5 24DC	24VDC motor - 500W - Ø 80
0,5 12DC_T	12VDC motor - 500W - Ø 80 + thermal switch
0,5 24DC_T	24VDC motor - 500W - Ø 80 + thermal switch
0,8 12DC	12VDC motor - 800W - Ø 80
0,8 24DC	24VDC motor - 800W - Ø 80
0,8 12DC_T	12VDC motor - 800W - Ø 80 + thermal switch
0,8 24DC_T	24VDC motor - 800W - Ø 80 + thermal switch
1,6 12DC_T	12VDC motor - 1600W - Ø 114 + thermal switch
2,1 12DC_T	12VDC motor - 2100W - Ø 114 + thermal switch
2,2 24DC_T	24VDC motor - 2200W - Ø 114 + thermal switch
3 24DC_T	24VDC motor - 3000W - Ø 125 + thermal switch
4 24DC_T	24VDC motor - 4000W - Ø 125 + thermal switch
2,5HD 12DC_T	12VDC motor - 2500W - Ø 151 fan cooled B14-90 frame + thermal switch
3HD 24DC_T	24VDC motor - 3000W - Ø 151 fan cooled B14-90 frame + thermal switch
4HD 24DC_T	24VDC motor - 4000W - Ø 151 fan cooled B14-90 frame + thermal switch



AC motors: three-phase 4 poles (~1450 rpm @ 50Hz / ~1750 rpm @ 60Hz)

E0,37AC 34 71	integral motor 0,37kW S3 3-ph 4-pole 220/380V 50/60Hz frame 71
E0,55AC 34 71	integral motor 0,55kW S3 3-ph 4-pole 220/380V 50/60Hz frame 71
E0,75AC 34 71	integral motor 0,75kW S3 3-ph 4-pole 220/380V 50/60Hz frame 71
E1,1AC 34 80	integral motor 1,1kW S3 3-ph 4-pole 220/380V 50/60Hz frame 80
E1,5AC 34 90	integral motor 1,5kW S3 3-ph 4-pole 220/380V 50/60Hz frame 90
E2,2AC 34 90	integral motor 2,2kW S3 3-ph 4-pole 220/380V 50/60Hz frame 90
E3,0AC 34 90	integral motor 3kW S3 3-ph 4-pole 220/380V 50/60Hz frame 90
E4,0AC 34 100	integral motor 4kW S3 3-ph 4-pole 220/380V 50/60Hz frame 100
E5,5AC 34 100	integral motor 5,5kW S3 3-ph 4-pole 220/380V 50/60Hz frame 100



AC motors: single-phase 4 poles (~1450 rpm @ 50Hz)

E0,37AC S4 71	integral motor 0,37kW S3 1-ph 4-pole 220V 50Hz frame 71
E0,55AC S4 71	integral motor 0,55kW S3 1-ph 4-pole 220V 50Hz frame 71
E0,75AC S4 80	integral motor 0,75kW S3 1-ph 4-pole 220V 50Hz frame 71
E1,10AC S4 90	integral motor 1,1kW S3 1-ph 4-pole 220V 50Hz frame 90
E1,50AC S4 90	integral motor 1,5kW S3 1-ph 4-pole 220V 50Hz frame 90
E2,20AC S4 90	integral motor 2,2kW S3 1-ph 4-pole 220V 50Hz frame 90
E3,00AC S4 100	integral motor 3kW S3 1-ph 4-pole 220V 50Hz frame 90



2 pole and special execution motors (High starting torque, high IP, with thermal protector,...) available on request

AC & DC electric motors

B14 AC motors

B14 7,5AC 32 112	B14 motor 7,5kW S3 3-ph 2-poles 220/380V 50/60Hz frame 112
B14 7,5AC 34 112	B14 motor 5,5kW S3 3-ph 4-poles 220/380V 50/60Hz frame 112



No motor: B14 Flange + coupling kit

XB14 71-0	mounting kit PPC for B14 motors frame 71 with pump group 0
XB14 80-0	mounting kit PPC for B14 motors frame 80 with pump group 0
XB14 71-1	mounting kit PPC for B14 motors frame 71 with pump group 1
XB14 80-1	mounting kit PPC for B14 motors frame 80 with pump group 1
XB14 90-1	mounting kit PPC for B14 motors frame 90 with pump group 1
XB14 100-1	mounting kit PPC for B14 motors frame 100/112 with pump group 1
X56C-0	mounting kit PPC for Nema 56C-face motors with pump group 0
X56C-1	mounting kit PPC for Nema 56C-face motors with pump group 1
XPU1401-0	kit drag pulley PPC with pump group 0
XPU1401-1	kit drag pulley PPC with pump group 1



Electric motors options

DC motors options

S150 12DC 80	starting relay 12VDC 150A with mounting kit for Ø 80 motors
S150 24DC 80	starting relay 24VDC 150A with mounting kit for Ø 80 motors
R100 12DC 80	starting relay with reverse gear 12VDC 100A
R100 24DC 80	starting relay with reverse gear 24VDC 100A
S150 12DC 112	starting relay 12VDC 150A with mounting kit for Ø 112-114 motors
S150 24DC 112	starting relay 24VDC 150A with mounting kit for Ø 112-114 motors
S200 12DC 125_151	starting relay 12VDC 200A with mounting kit for Ø 125-151 motors
S200 24DC 125_151	starting relay 24VDC 200A with mounting kit for Ø 125-151 motors
FP	forced ventilation system for motors Ø 114 and Ø 125
MC	plastic protection for motor protection DC Ø112-114



Universal central manifold

Section B

International execution (1/4" BSP exit ports)

UA	Universal A type PPC body with 3 lateral cavities
UB	Universal B type PPC body with 5 lateral cavities
U4	Universal 4 type PPC body for 4 way cartridge valves
UR	Universal R type PPC body for reversible pump

USA execution (SAE 06 exit ports)

UAUS	Universal A type PPC body with 3 lateral cavities US execution
UBUS	Universal B type PPC body with 5 lateral cavities US execution
U4US	Universal 4 type PPC body for 4 way cartridge valves US execution
URUS	Universal R type PPC body for reversible pump US execution



Gear pumps

G0,1	gear pump group 0 – 0,19 cc/rev G series + adaptor flange for group 0 pump
G0,2	gear pump group 0 – 0,26 cc/rev G series + adaptor flange for group 0 pump
G0,4	gear pump group 0 – 0,38 cc/rev G series + adaptor flange for group 0 pump
G0,6	gear pump group 0 – 0,64 cc/rev G series + adaptor flange for group 0 pump
G0,8	gear pump group 1 – 0,85 cc/rev G series
G1,1	gear pump group 1 – 1,15 cc/rev G series
G1,3	gear pump group 1 – 1,3 cc/rev G series
G1,6	gear pump group 1 – 1,6 cc/rev G series
G2,1	gear pump group 1 – 2,1 cc/rev G series
G2,6	gear pump group 1 – 2,6 cc/rev G series
G3,2	gear pump group 1 – 3,2 cc/rev G series
G3,7	gear pump group 1 – 3,7 cc/rev G series
G4,2	gear pump group 1 – 4,2 cc/rev G series
G4,9	gear pump group 1 – 4,9 cc/rev G series
G6,0	gear pump group 1 – 6,0 cc/rev G series
G7,9	gear pump group 1 – 7,9 cc/rev G series
G9,8	gear pump group 1 – 9,8 cc/rev G series



K0,2	gear pump group 0 – 0,26 cc/rev K series + adaptor flange for group 0 pump
K0,4	gear pump group 0 – 0,38 cc/rev K series + adaptor flange for group 0 pump
K0,6	gear pump group 0 – 0,64 cc/rev K series + adaptor flange for group 0 pump
K0,9	gear pump group 1 – 0,89 cc/rev K series
K1,2	gear pump group 1 – 1,27 cc/rev K series
K1,6	gear pump group 1 – 1,66 cc/rev K series
K2,1	gear pump group 1 – 2,17 cc/rev K series
K2,7	gear pump group 1 – 2,8 cc/rev K series
K3,2	gear pump group 1 – 3,3 cc/rev K series
K3,7	gear pump group 1 – 3,8 cc/rev K series
K4,2	gear pump group 1 – 4,3 cc/rev K series
K5,0	gear pump group 1 – 5,1 cc/rev K series
K6,0	gear pump group 1 – 6,0 cc/rev K series
K7,9	gear pump group 1 – 7,9 cc/rev K series



H1,2	gear pump group 1 high pressure – 1,2 cc/rev H series
H1,7	gear pump group 1 high pressure – 1,7 cc/rev H series
H2,2	gear pump group 1 high pressure – 2,2 cc/rev H series
H2,6	gear pump group 1 high pressure – 2,6 cc/rev H series
H3,2	gear pump group 1 high pressure – 3,2 cc/rev H series
H3,8	gear pump group 1 high pressure – 3,8 cc/rev H series
H4,2	gear pump group 1 high pressure – 4,3 cc/rev H series
H4,7	gear pump group 1 high pressure – 4,7 cc/rev H series
H6,0	gear pump group 1 high pressure – 6,0 cc/rev H series
H7,4	gear pump group 1 high pressure – 7,4 cc/rev H series



Gear pumps

Bidirectional gear pumps

R0,3	Reversible gear pump group 0 - 0,32 cc/rev R series + adaptor flange for group 0 pump
R0,5	Reversible gear pump group 0 - 0,49 cc/rev R series + adaptor flange for group 0 pump
R0,7	Reversible gear pump group 0 - 0,64 cc/rev R series + adaptor flange for group 0 pump
R0,9	Reversible gear pump group 0 - 0,88 cc/rev R series + adaptor flange for group 0 pump
R1,3	Reversible gear pump group 0 - 1,25 cc/rev R series + adaptor flange for group 0 pump
R1,5	Reversible gear pump group 0 - 1,54 cc/rev R series + adaptor flange for group 0 pump
R2,1	Reversible gear pump group 1 - 2,2 cc/rev R series
R2,6	Reversible gear pump group 1 - 2,6 cc/rev R series
R3,2	Reversible gear pump group 1 - 3,2 cc/rev R series
R4,3	Reversible gear pump group 1 - 4,3 cc/rev R series
R6,5	Reversible gear pump group 1 - 6,5 cc/rev R series



Double gear pumps with Hi-Lo system

K0,9+3,2HL	HI-LO double pump - 0,9 + 3,3cc/rev K series
K1,2+5HL	HI-LO double pump - 1,2 + 5cc/rev K series



Helical rotor pumps for high pressure and low noise and low pulsation applications

S2,2	low noise helical rotor pump group 1 - 2,2 cc/rev S series
S3,2	low noise helical rotor pump group 1 - 3,2 cc/rev S series
S4,3	low noise helical rotor pump group 1 - 4,3 cc/rev S series
S5,0	low noise helical rotor pump group 1 - 5,0 cc/rev S series
S6,4	low noise helical rotor pump group 1 - 6,4 cc/rev S series
S8,3	low noise helical rotor pump group 1 - 8,3 cc/rev S series
S10	low noise helical rotor pump group 1 - 10,2 cc/rev S series
S13	low noise helical rotor pump group 1 - 12,9 cc/rev S series



Integral components: Cavity 0

Components in central manifold cavity 0

J	check valve ball type 3/4-16UNF
JF	check valve ball type 3/4-16UNF with exit port P static F 1/4 BSPP
S	flow control valve 3/4-16UNF with screw
L	plug 3/4-16UNF basic
N	plug 3/4-16UNF open passage with 1/4"BSPP exit port



Cavity 0 option

P01	plug TCE 1/4 BSPP with copper washer
EM90	pressure gauge shut-off valve 90° F-F spinning + nipples M-M 1/4 BSPP
EMIL	pressure gauge shut-off valve F-F spinning + nipples M-M 1/4 BSPP
MIR63***EM90	pressure gauge Ø63 where *** = P max (060-160-250-315 bar) + EM90
MIR63***EMIL	pressure gauge Ø63 where *** = P max (060-160-250-315 bar) + EMIL
F401***W	pressure switch 1/4 BSPP where *** = P max (050-100-200-400 bar)
V-CSB	handwheel for CSB



Section D

Integral components: Cavity 1

Components in central manifold cavity 1

D_60	guided needle relief valve M20x1,5 - 5÷60 bar - socket screw adj.
D_180	guided needle relief valve M20x1,5 - 10÷180 bar - socket screw adj.
D_310	guided needle relief valve M20x1,5 - 35÷310 bar - socket screw adj.
XP	closed plug for relief valve M20x1,5 cavity



Cavity 1 option

2	handwheel M8 for valves VMDC35/VMDC20/VCF6
3	steel cap for valve VMDC35
4	plastic seal for VMDC35 relief valve



Integral components: Cavity 2 and Cavity 4

Components in central manifold cavity 2 and cavity 4

A	NC solenoid 2/2 way 3/4-16UNF poppet valve
B	NC solenoid 2/2 way 3/4-16UNF poppet valve with emergency
Q	NO solenoid 2/2 way 3/4-16UNF poppet valve
C	NO solenoid 2/2 way 3/4-16UNF poppet valve with emergency
D	NC solenoid 2/2 way 3/4-16UNF double poppet valve with emergency
E	lever operated 2/2 way valve without micro-switch
EM	lever operated 2/2 way valve with micro-switch
Z	2 way emergency button valve
S	bidirectional flow control valve 3/4-16UNF with screw
T12DC	proportional flow control valve poppet type 15l/min 315 bar + coil 12VDC ED100%
T24DC	proportional flow control valve poppet type 15l/min 315 bar + coil 24VDC ED100%
U	hand pump 3/4-16UNF 2 cc/stroke + suction/return line pipe 1/4"BSPP 370mm
G	closed plug 3/4-16UNF
H	plug 3/4-16UNF with 1/4"BSPP exit port
N	plug 3/4-16UNF open passage with 1/4"BSPP exit port
P	plug 3/4-16UNF passing through 1/4"BSPP
L	plug 3/4-16UNF basic
J	check valve ball type 3/4-16UNF
4VA11C	4/2way solenoid directional valve, closed center transient (only for cav.2 in U4manifolds)
4VA2	4/3 way solenoid directional valve, center P to T (only for cavity 2 in U4 manifolds)
4VB2	4/3 way solenoid directional valve, closed center (only for cavity 2 in U4 manifolds)
4VC2	4/3 way solenoid directional valve, H center (only for cavity 2 in U4 manifolds)
4VE2	4/3 way solenoid directional valve, center A-B to T (only for cavity 2 in U4 manifolds)



Cavity 2 and 4 options

V-CSB	handwheel for CSB
P01	plug TCE 1/4 BSPP with copper washer
EM90	pressure gauge shut-off valve 90° F-F spinning + nipples M-M 1/4 BSPP
EMIL	pressure gauge shut-off valve F-F spinning + nipples M-M 1/4 BSPP
MIR63***EM90	pressure gauge Ø63 where *** = P max (060-160-250-315 bar) + EM90
MIR63***EMIL	pressure gauge Ø63 where *** = P max (060-160-250-315 bar) + EMIL
F401***W	pressure switch 1/4 BSPP where *** = P max (050-100-200-400 bar)
VPC00	PWM driver for proportional valves 12/24VDC



Integral components: Cavity 3

Components in central manifold cavity 3

F1	fixed pressure compensated flow control valve 3/4-16UNF flow - 1l/min
F1,5	fixed pressure compensated flow control valve 3/4-16UNF flow - 1,5l/min
F2	fixed pressure compensated flow control valve 3/4-16UNF flow - 2l/min
F3	fixed pressure compensated flow control valve 3/4-16UNF flow - 3l/min
F5	fixed pressure compensated flow control valve 3/4-16UNF flow - 5l/min
F7	fixed pressure compensated flow control valve 3/4-16UNF flow - 7l/min
F10	fixed pressure compensated flow control valve 3/4-16UNF flow - 10l/min
F13	fixed pressure compensated flow control valve 3/4-16UNF flow - 13l/min
F17	fixed pressure compensated flow control valve 3/4-16UNF flow - 17l/min
F22	fixed pressure compensated flow control valve 3/4-16UNF flow - 22l/min
R2	compensated flow control valve 3/4-16UNF with screw - 1 ÷ 2,2 l/min
R3	compensated flow control valve 3/4-16UNF with screw - 1,6 ÷ 4 l/min
R4	compensated flow control valve 3/4-16UNF with screw - 2,5 ÷ 5 l/min
R5	compensated flow control valve 3/4-16UNF with screw - 3 ÷ 7 l/min
R6	compensated flow control valve 3/4-16UNF with screw - 4,9 ÷ 10,8 l/min
R7	compensated flow control valve 3/4-16UNF with screw - 8 ÷ 18,5 l/min
S	flow control valve 3/4-16UNF with screw
Z	2 way emergency button valve
AR	NC solenoid 2/2 way 3/4-16UNF poppet valve with reversible flow
BR	NC solenoid 2/2 way 3/4-16UNF poppet valve +emergency with reversible flow
CR	NO solenoid 2/2 way 3/4-16UNF poppet valve +emergency with reversible flow
D	NC solenoid 2/2 way 3/4-16UNF double poppet valve with emergency
J	check valve ball type 3/4-16UNF
G	closed plug 3/4-16UNF
H	plug 3/4-16UNF with 1/4"BSPP exit port
N	plug 3/4-16UNF open passage with 1/4"BSPP exit port
P	plug 3/4-16UNF passing through 1/4"BSPP
L	basic plug 3/4-16UNF
P***12DC	prop. relief valve 3/4-16UNF with em. 12VDC where *** = max pressure (80-250 bar)
P***24DC	prop. relief valve 3/4-16UNF with em. 24VDC where *** = max pressure (80-250 bar)
V***	relief valve 3/4-16UNF where ** = max pressure (40-110-250-350 bar) - socket screw



Cavity 3 option

2	handwheel M8 for valves VMDC35/VMDC20/VCF6
V-CSB	handwheel for CSB
P01	plug TCE 1/4 BSPP with copper wahser
EM90	pressure gauge shut-off valve 90° F-F spinning + nipples M-M 1/4 BSPP
EMIL	pressure gauge shut-off valve F-F spinning + nipples M-M 1/4 BSPP
MIR63***EM90	pressure gauge Ø63 where *** = P max (060-160-250-315 bar) + EM90
MIR63***EMIL	pressure gauge Ø63 where *** = P max (060-160-250-315 bar) + EMIL
F401***W	pressure switch 1/4 BSPP where *** = P max (050-100-200-400 bar)
VPC00	PWM driver for proportional valves 12/24VDC



Integral components: Cavity 5, Cavity 6 and Cavity 8

Components in central manifold cavity 5, cavity 6 and cavity 8

P01	1/4" BSPP plug with copper washer
PP01370	suction/return line pipe 1/4"BSP 370mm
RETURN-KIT	1/4" BSP holder for SF12 + flexible plastic pipe 12 mm for return line / price per meter
RF01	return line tank immersed filter + drain pipe 1/4 BSPP
1(01)	fixed pressure compensated flow control valve 1/4"BSPP - 1l/min
1,5(01)	fixed pressure compensated flow control valve 1/4"BSPP - 1,5l/min
2(01)	fixed pressure compensated flow control valve 1/4"BSPP - 2l/min
3(01)	fixed pressure compensated flow control valve 1/4"BSPP - 3l/min
5(01)	fixed pressure compensated flow control valve 1/4"BSPP - 5l/min
7(01)	fixed pressure compensated flow control valve 1/4"BSPP - 7l/min
10(01)	fixed pressure compensated flow control valve 1/4"BSPP - 10l/min
13(01)	fixed pressure compensated flow control valve 1/4"BSPP - 13l/min
17(01)	fixed pressure compensated flow control valve 1/4"BSPP - 17l/min
22(01)	fixed pressure compensated flow control valve 1/4"BSPP - 22l/min



Integral components: Cavity 7

Components in central manifold cavity 7

1(04)	fixed pressure compensated flow control valve Ø 12,7 con o-ring - 1l/min
1,5(04)	fixed pressure compensated flow control valve Ø 12,7 con o-ring - 1,5l/min
2(04)	fixed pressure compensated flow control valve Ø 12,7 con o-ring - 2l/min
3(04)	fixed pressure compensated flow control valve Ø 12,7 con o-ring - 3l/min
5(04)	fixed pressure compensated flow control valve Ø 12,7 con o-ring - 5l/min
7(04)	fixed pressure compensated flow control valve Ø 12,7 con o-ring - 7l/min
10(04)	fixed pressure compensated flow control valve Ø 12,7 con o-ring - 10l/min
13(04)	fixed pressure compensated flow control valve Ø 12,7 con o-ring - 13l/min
17(04)	fixed pressure compensated flow control valve Ø 12,7 con o-ring - 17l/min
22(04)	fixed pressure compensated flow control valve Ø 12,7 con o-ring - 22l/min



Integral components: Cavity 9

Components in central manifold cavity 9

S01C	starting valve for single-phase motors for flow from 2 to 3 lt/min
S01D	starting valve for single-phase motors for flow from 3 to 4 lt/min
S01E	starting valve for single-phase motors for flow from 4 to 5,5 lt/min
S01F	starting valve for single-phase motors for flow from 5,5 to 7 lt/min
S01G	starting valve for single-phase motors for flow from 7 to 9 lt/min
S01H	starting valve for single-phase motors for flow from 9 to 10,5 lt/min
S01I	starting valve for single-phase motors for flow from 10,5 to 12,5 lt/min
S01L	starting valve for single-phase motors for flow from 12,5 to 14 lt/min
S01N	starting valve for single-phase motors for flow from 14 to 15,5 lt/min



Tanks

Serbatoio in metallo

1,5A	1,5l cylindrical steel tank horizontal mounting + 1/2"BSPP std filler & breather plug
1,5AV	1,5l cylindrical steel tank vertical mounting + 1/2"BSPP std filler & breather plug
2,5A	2,5l cylindrical steel tank horizontal mounting + 1/2"BSPP std filler & breather plug
2,5AV	2,5l cylindrical steel tank vertical mounting + 1/2"BSPP std filler & breather plug
5B	5l cylindrical steel tank horizontal mounting + 1/2"BSPP std filler & breather plug
5BV	5l cylindrical steel tank vertical mounting + 1/2"BSPP std filler & breather plug
10B	10l cylindrical steel tank horizontal mounting + 1/2"BSPP std filler & breather plug
10BV	10l cylindrical steel tank vertical mounting + 1/2"BSPP std filler & breather plug
12B	12l cylindrical steel tank horizontal mounting + 1/2"BSPP std filler & breather plug
12BV	12l cylindrical steel tank vertical mounting + 1/2"BSPP std filler & breather plug
10C	10l square steel tank horizontal mounting + 1/2"BSPP std filler & breather plug
10CV	10l square steel tank vertical mounting + 1/2"BSPP std filler & breather plug
22C	22l square steel tank horizontal mounting + 3/4"BSPP std filler & breather plug
22CV	22l square steel tank vertical mounting + 3/4"BSPP std filler & breather plug
3EV	3l square steel tank vertical mounting + 1/2"BSPP std filler & breather plug
7EV	7l square steel tank vertical mounting + 1/2"BSPP std filler & breather plug
8EV	8l square steel tank vertical mounting + 3/4"BSPP std filler & breather plug
15EV	15l square steel tank vertical mounting + 3/4"BSPP std filler & breather plug
20EV	20l square steel tank vertical mounting + 3/4"BSPP std filler & breather plug and level
30EV	30l square steel tank vertical mounting + 3/4"BSPP std filler & breather plug and level
F80000001	steel tank adapter for PPC - to be welded on custom made tanks



Plastic tanks

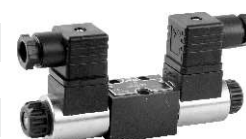
1,5L	1,5l square plastic tank type L horizontal mounting + 3/4"BSPP F filler & breather plug
1,5LV	1,5l square plastic tank type L vertical mounting + 3/4"BSPP F filler & breather plug
3L	3l square plastic tank type L horizontal mounting + 3/4"BSPP F filler & breather plug
3LV	3l square plastic tank type L vertical mounting + 3/4"BSPP F filler & breather plug
6L	6l square plastic tank type L horizontal mounting + 3/4"BSPP F filler & breather plug
6LV	6l square plastic tank type L vertical mounting + 3/4"BSPP F filler & breather plug
5M	5l square plastic tank 170mm type M horizontal mounting + 3/4"BSPP F filler & breather
5MV	5l square plastic tank 170mm type M vertical mounting + 3/4"BSPP F filler & breather
8M	8l square plastic tank 170mm type M horizontal mounting + 3/4"BSPP F filler & breather
8MV	8l square plastic tank 170mm type M vertical mounting + 3/4"BSPP F filler & breather
5P	5l round plastic tank for PPC Ø195mm horizontal mounting + 1/2"BSPP filler & breather
5PV	5l round plastic tank for PPC Ø195mm vertical mounting + 1/2"BSPP filler & breather
7P	7l round plastic tank for PPC Ø195mm horizontal mounting + 1/2"BSPP filler & breather
7PV	7l round plastic tank for PPC Ø195mm vertical mounting + 1/2"BSPP filler & breather
9P	9l round plastic tank for PPC Ø195mm horizontal mounting + 1/2"BSPP filler & breather
9PV	9l round plastic tank for PPC Ø195mm vertical mounting + 1/2"BSPP filler & breather
11P	11l round plastic tank for PPC Ø195mm horizontal mounting + 1/2"BSPP filler & breather
11PV	11l round plastic tank for PPC Ø195mm vertical mounting + 1/2"BSPP filler & breather



External valves

Valvole esterne

MSV3V4000000	3/2 way solenoid cartridge valve, A to T de-energized
MSV3000000	NC solenoid 2/2 way 3/4-16UNF poppet valve
MSV30E0000	NC solenoid 2/2 way 3/4-16UNF poppet valve with emergency
MSV3100000	NO solenoid 2/2 way 3/4-16UNF poppet valve
MSV31E0000	NO solenoid 2/2 way 3/4-16UNF poppet valve with emergency
MDV30E0000	NC solenoid 2/2 way 3/4-16UNF double poppet valve with emergency
SD00A11C	NG3 MICRO solenoid directional valve 4 way, 2 positions
SD00A2	NG3 MICRO solenoid directional valve 4 way, 3 pos. center P to T
SD00B2	NG3 MICRO solenoid directional valve 4 way, 3 pos. closed center
SD00C2	NG3 MICRO solenoid directional valve 4 way, 3 pos. H center
SD00E2	NG3 MICRO solenoid directional valve 4 way, 3 pos. center A-B to T
SD01A11C	Stackable solenoid directional valve 4 way, 2 positions
SD01A2	Stackable solenoid directional valve 4 way, 3 pos. center P to T
SD01B2	Stackable solenoid directional valve 4 way, 3 pos. closed center
SD01C2	Stackable solenoid directional valve 4 way, 3 pos. H center
SD01E2	Stackable solenoid directional valve 4 way, 3 pos. center A-B to T
SD01A11CC	Stackable solenoid directional valve 4 way, 2 positions - upper closing element
SD01A2C	Stackable solenoid directional valve 4 way, 3 pos. center P to T - upper closing element
SD01B2C	Stackable solenoid directional valve 4 way, 3 pos. closed center - upper closing element
SD01C2C	Stackable solenoid directional valve 4 way, 3 pos. H center - upper closing element
SD01E2C	Stackable solenoid directional valve 4 way, 3 pos. H center - upper closing element
SD02A11C	Stackable solenoid directional valve 4 way, 2 positions lateral ports
SD02A2	Stackable solenoid directional valve 4 way, 3 pos. center P to T lateral ports
SD02B2	Stackable solenoid directional valve 4 way, 3 pos. closed center lateral ports
SD02C2	Stackable solenoid directional valve 4 way, 3 pos. H center lateral ports
SD02E2	Stackable solenoid directional valve 4 way, 3 pos. center A-B to T lateral ports
SD02C2RP	Stackable solenoid directional valve 4 way, 3 pos. H center + piloted check valves
SD02E2RP	Stackable solenoid directional valve 4 way, 3 pos. center A-B to T + piloted check valves
SD02A11CTP	Stackable solenoid directional valve 4 way, 2 pos. + cavity 3/4-16UNF for add valves
SD02A2TP	Stack. solenoid direct. valve 4 way,3 pos.center P to T+cavity 3/4-16UNF for add valves
SD02B2TP	Stack. solenoid direct. valve 4 way,3 pos.closed center + cavity3/4-16UNF for add valves
SD02C2TP	Stack. solenoid direct. valve 4 way,3 pos. H center + cavity 3/4-16UNF for add valves
SD02E2TP	Stack. solenoid direct. valve 4 way,3 pos. center A-BtoT+cavity3/4-16UNF for add valves
SD03A11C	NG6 (cetop3) solenoid directional valve 4 way, 2 positions
SD03A2	NG6 (cetop3) solenoid directional valve 4 way, 3 pos. center P to T
SD03B2	NG6 (cetop3) solenoid directional valve 4 way, 3 pos. closed center
SD03C2	NG6 (cetop3) solenoid directional valve 4 way, 3 pos. H CENTER
SD03E2	NG6 (cetop3) solenoid directional valve 4 way, 3 pos. center A-B to T
HD03A1	NG6 (cetop3) manual directional valve, spring centered P to T
HD03A2	NG6 (cetop3) manual directional valve, spring centered closed center
HD03A3	NG6 (cetop3) manual directional valve, spring centered H center
HD03A10	NG6 (cetop3) manual directional valve, spring centered A-B to T
HD03D1	NG6 (cetop3) manual directional valve, detent, center P to T
HD03D2	NG6 (cetop3) manual directional valve, detent, closed center
HD03D3	NG6 (cetop3) manual directional valve, detent, H center
HD03D10	NG6 (cetop3) manual directional valve, detent, center A-B to T



General application

Install location	Whatever you do, 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 higher than the class 18/14 ISO 4406
Instructions for the first start	<ul style="list-style-type: none"> • After connecting the electric motor and the suction tube, check the direction of rotation of the pump with small goodwill of 1+2 sec. For standard pumps the direction of motor rotation must be clockwise as viewed from the side of the fan motor. • Flush the oil at atmospheric pressure so as to remove any impurities and air bubbles from the circuit. • Connect all devices to the system and very gradually bring the circuit under pressure. • Check the oil level and, if necessary, fill up to the maximum level. • To ensure a 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.
Torques recommended	<ul style="list-style-type: none"> • M5: 4÷5,5 Nm • M5 for pumps gr.0,5: 8÷9,5 Nm • M6: 8÷10 Nm • M8: 16÷20 Nm • M8 for pumps gr.1: 21÷25 Nm • M10: 30÷40 Nm • Valves and plugs 1/4 BSPP: 6÷20 Nm • Valves and plugs 3/4-16 UNF: 15÷40 Nm • Relief valves M20x1,5: 50 Nm • Tank's plugs 1/2 BSPP: max 10 Nm

HPC02	Technical data
ELECTRONIC FEATURES	
Outputs	configurable, with diagnostic capability 12 x PWM / CURRENT / ON-OFF - 2000 mA 2 x ON-OFF - 5000 mA 2 x Analog (0...10 V) 12bit
Sensor supply	1 x 5 V, max. 0,5 W
	see the wiring diagrams for further details
Operating voltage Overvoltage	9...52 V DC 60 V for t ≤ 10 s
Reverse polarity protection	yes, in case of supply via an on-board system (battery)
Power consumption VBB ₃₀	8 W
CAN interfaces 0...2 Baud rate Communication profile	CAN interface 2.0 A/B, ISO 11898 20 kbits/s...1 Mbit/s (default 250 kbits/s) CANopen, CiA DS 301 V4.2, CiA DS 401 V 1.4 / SAE J 1939 / free protocol
Ethernet interface Transmission rate Protocols	10/100 Mbits/s TCP/IP, UDP/IP, Modbus UDP
Processor	32-bit Texas Instrument RM48
Device monitoring	overvoltage and undervoltage monitoring watchdog function (extended safety monitoring according to IEC 62061 and ISO 13849) check sum test for program and system excess temperature monitoring
Process monitoring concept	second switch-off way per output group via semiconductor switch
Physical memory	Flash: ?? MBytes RAM: ?? MBytes non-volatile memory: ?? KBytes
Memory allocation	Memory can be allocated for safe and non-safe applications see programming manual
Software/programming	
Programming system	CODESYS version 3.5 with SIL 2 extension (IEC 61131-3)
Light indicators	
Application LED	1 x two-colour LED (red / green) application controlled

HPC02
Technical data

Operating states PLC / application

LED	Co- lour	Status	Description
APP 0	red	on	status display of the application, freely program- mable
	green	on	status display of the application, freely program- mable
	orange	on	status display of the application, freely program- mable

Safety-related characteristics

Safety Integrity Level Claim Limit	SIL CL	2
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Component	PFH _b [1/h]
Input, external, single channel	< 4.0 x 10 ⁻⁹
Input, external, dual channel	< 5.0 x 10 ⁻¹⁰
Logic	<1.0 x 10 ⁻⁷
Output, external, single channel	< 2.0 x 10 ⁻⁸
Output, external, dual channel	< 1.0 x 10 ⁻⁹

Lifetime: 8000 h operating time

HPC02
AI01...AI11
Multifunction inputs analogue / digital

Current input 0 ... 20 mA (A)

Voltage input 0...10 V (A)

Voltage input 0...32 V (A)

Digital input

RPM0H....RPM0L
RPM1H....RPM1L
Digital inputs, frequency measure-
ment

 Frequency input (FRQ_{L/H})

input characteristics

Resolution	12 bits
Input frequency	< 330 Hz
Measuring ranges	0...10 V, 0...32 V, 0...20 mA, ratiometric, binary low side
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break

Input resistance	??? Ω
Range diagnostics min./max.	0 mA / 20 mA (default)
Accuracy	± 1.5 % FS

Input resistance	???? kΩ
Range diagnostics min./max.	0 V / 10 V (default)
Accuracy	± 1% FS

Input resistance	???? kΩ
Range diagnostics min./max.	0 V / 32 V (default)
Accuracy	± 1% FS

Input resistance	??? kΩ
Switch-on level	> 0.7 VBB ₃₀
Switch-off level	< 0.3 VBB ₃₀
Range diagnostics min./max.	1 V / 0.95 VBB ₃₀ (default)
Accuracy	± 1% FS

Resolution	12 bits
------------	---------

Input resistance	10 kΩ
Input frequency	≤ 30 kHz
Switch-on level	> 0.7 VBB ₃₀
Switch-off level	< 0.3 VBB ₃₀
Accuracy	± 10 μs

HPC02

PWR5A0
PWR5A1

Digital OUT 5A

Digital output

output characteristics

Switching voltage	8...52 V DC
Switching current	0.025...4 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	?? %
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND

Range diagnostics min./max.	0 A / 5 A (default)
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HPC02
PWM00....PWM11
Digital / PWM outputs 2.0 A

Digital output

PWM output

Current-controlled output ()

output characteristics

Switching voltage	9...52 V DC
Switching current	0.1...2.0 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	1% FS
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND

Range diagnostics min./max.	0 A / 2.0 A (default)
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Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ (at 20...250 Hz)
Range diagnostics min./max.	0 A / 2.5 A (default)

Output frequency	20...2000 Hz (per channel)
Control range	0.05...2.5 A
Setting resolution	1 mA (at 20...250 Hz)
Control resolution	2 mA
Load resistance	≥ 4.8 Ω / (at 12 V DC) ≥ 9.6 Ω / (at 24 V DC)
Accuracy	± 1.5 % FS (for inductive loads)
Range diagnostics min./max.	0 A / 2.5 A (default)

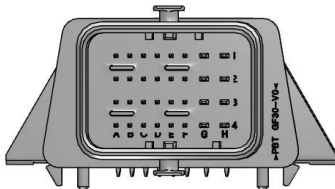
HPC02	output characteristics								
5VDC Sensor supply	for sensors and joysticks 5 V, 100 mA accuracy $\pm 5\%$ short-circuit proof and overload protected								
PRG010V0 PRG010V1 Analogue outputs	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Current rating</td> <td style="width: 50%; text-align: center;">< 5 mA</td> </tr> <tr> <td>Output voltage</td> <td style="text-align: center;">0...10 V</td> </tr> <tr> <td>Accuracy</td> <td style="text-align: center;">$\pm 5\%$ FS</td> </tr> <tr> <td>Step response time 10...90 %</td> <td style="text-align: center;">< 1.8 ms</td> </tr> </table>	Current rating	< 5 mA	Output voltage	0...10 V	Accuracy	$\pm 5\%$ FS	Step response time 10...90 %	< 1.8 ms
Current rating	< 5 mA								
Output voltage	0...10 V								
Accuracy	$\pm 5\%$ FS								
Step response time 10...90 %	< 1.8 ms								
VPOWER1.....4									
Load current per output group	≤ 10 A								
Internal semiconductor switches	One switch in series of 4 semiconductor outputs each. Forced controlling by means of hardware and additional controlling by means of user program.								
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Switching current</td> <td style="width: 50%; text-align: center;">0.1...10 A</td> </tr> <tr> <td>Current diagnostics (excessive current)</td> <td style="text-align: center;">> 10 A</td> </tr> </table>	Switching current	0.1...10 A	Current diagnostics (excessive current)	> 10 A				
Switching current	0.1...10 A								
Current diagnostics (excessive current)	> 10 A								
Short-circuit strength to GND	Outputs are switched off via the output driver								

HPC02

Technical data

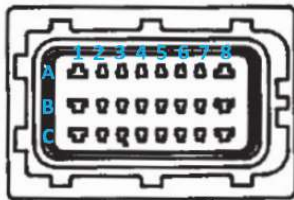
Connectors

J1



	A	B	C	D	E	F	G	H
1	PWM3	VBAT	GNDBAT	CAN0H	CAN0L	AI0	GND P1	VPOWER1
2	PWM2	AI2	AI3	AI4	AI5	AI6	GND P2	VPOWER2
3	PWM1	AI1	RPM1H	RPM1L	RPM0H	RPM0L	GND P4	VPOWER4
4	PWM0	PWM4	PWM5	PWM6	PWM7	5VDC	PWR 5A0	PWR5 A1

J2



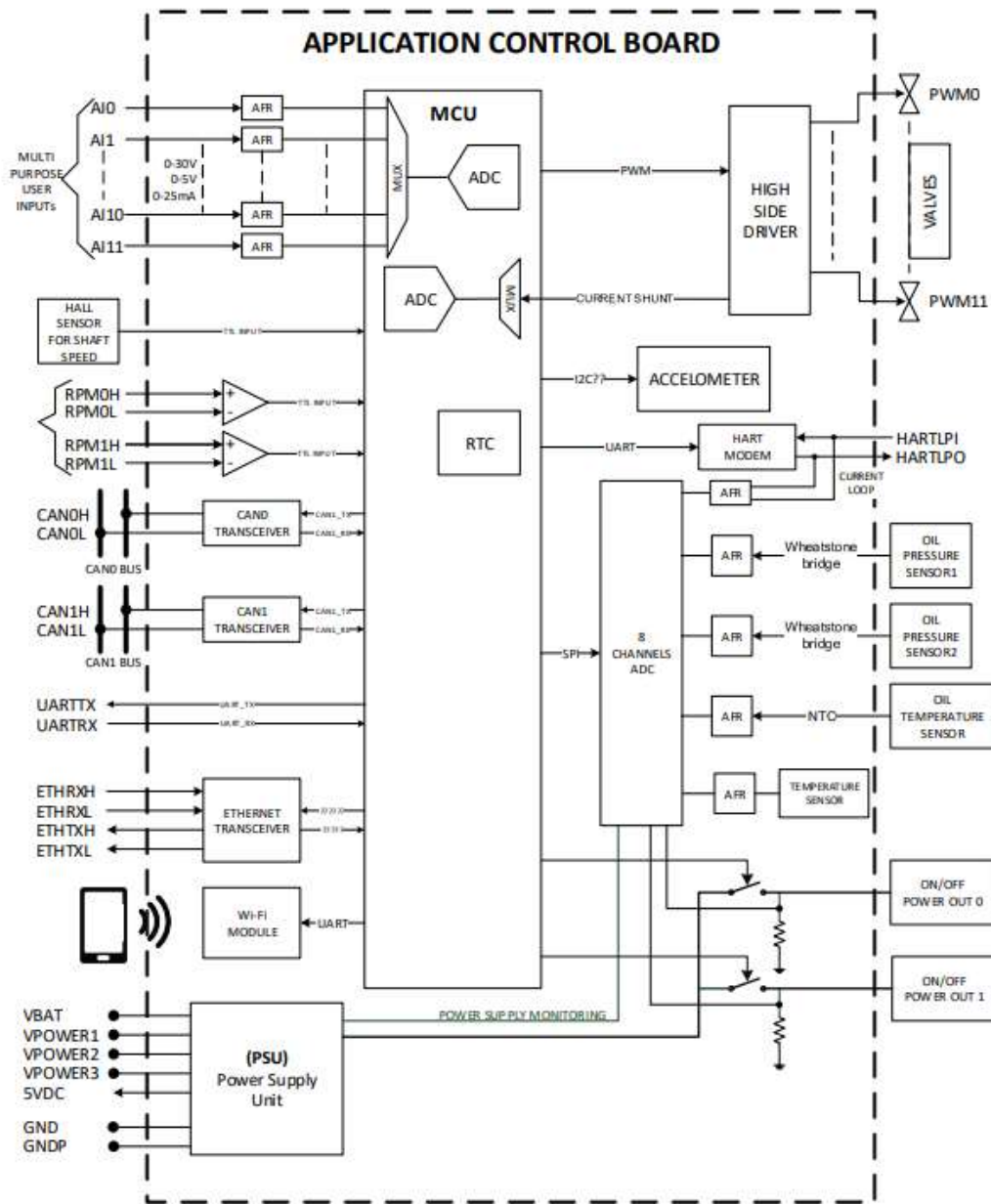
	1	2	3	4	5	6	7	8
A	GNDP3	VPOWER3		CAN1H	ETHTD-	ETHTD+	AI7	AI8
B	PWM9	PWM10		CAN1L	ETHRD+	ETHRD-	AI9	AI10
C	PWM8	PWM11						AI11

ETH

M12 socket, 4 poles, D-coded

- 1: TxD+
- 2: RxD+
- 3: TxD+
- 4: RxD-





Abbreviations

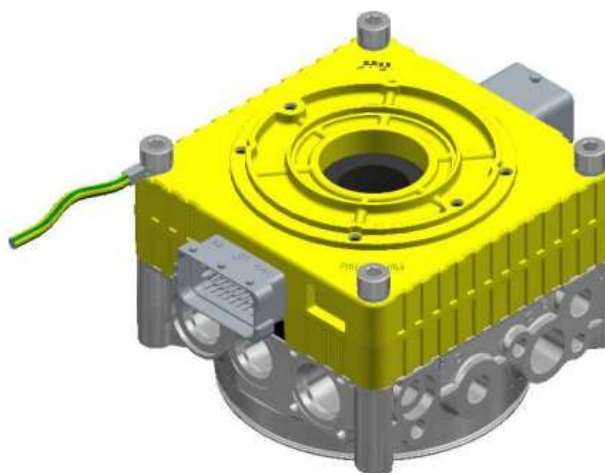
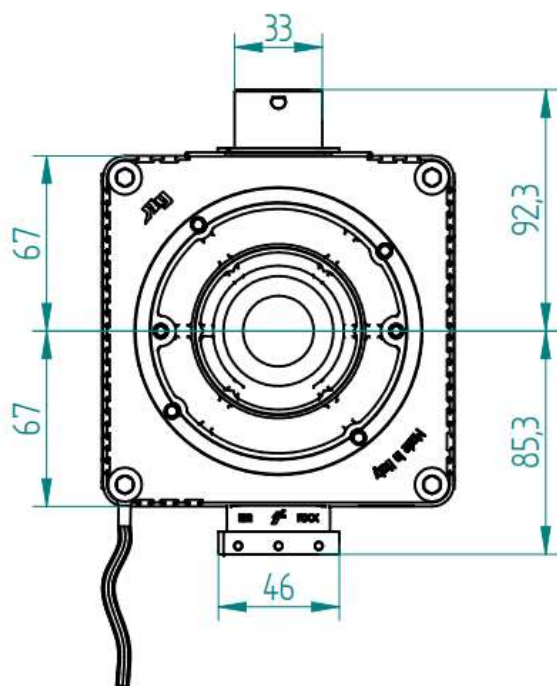
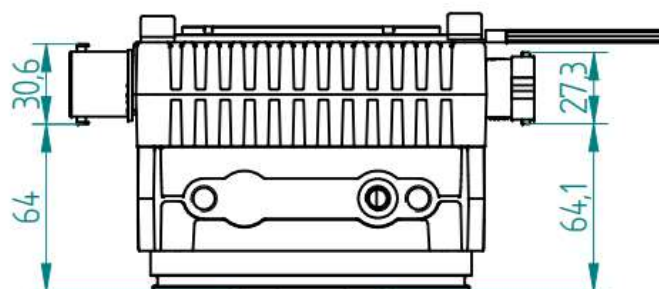
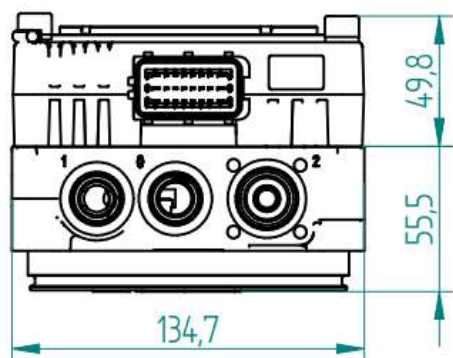
- A analogue
- B_H binary high side (CSO)
- B_L binary low side (CSI)
- FRQ_{L/H} frequency/pulse inputs configurable low side (CSI) / high side (CSO)
- H H-bridge function
- PSU power supply for the system
- PWM_H pulse-width modulation high side (CSO)
- PWM_L pulse-width modulation low side (CSI)
- PWM_i pulse-width modulation current-controlled
- R resistor input
- VBB_{0..2} supply output group
- VBB₃₀ supply controller

HPC02

Technical data

Mechanic

OVERALL DIMENSIONS HPC02 with PQ hydraulic scheme



HPC02	Technical data	
Test standards and regulations		
CE mark	EN IEC 62061	Safety of machinery - Functional safety of electrical, electronic and programmable safety-related control systems
	EN 61000-6-2	Electromagnetic compatibility (EMC) Immunity
	EN 61000-6-4	Electromagnetic compatibility (EMC) Emission
	EN 61010	Safety requirements for electrical equipment for measurement, control and laboratory use
Electrical tests	ISO 7637-2	Pulse 1, severity level: IV; function state C Pulse 2a, severity level: IV; function state A Pulse 2b, severity level: IV; function state C Pulse 3a, severity level: IV; function state A Pulse 3b, severity level: IV; function state A Pulse 4, severity level: IV; function state A Pulse 5, severity level: III; function state A (data valid for the 24 V system) Pulse 4, severity level: III; function state A (data valid for the 12 V system)
Climatic tests	EN 60068-2-30	Damp heat, cyclic Upper temperature ?? °C, number of cycles: ??
	EN 60068-2-78	Damp heat, steady state Test temperature 40°C / 93% RH, test duration: 21 days
	EN 60068-2-52	Salt spray test Severity level 3 (vehicle)
Mechanical tests	ISO 16750-3	Test VII; vibration, random Mounting location: vehicle body
	EN 60068-2-6	Vibration, sinusoidal 10...500 Hz; 0.72 mm/10 g; 10 cycles/axis
	ISO 16750-3	Bump 30 g/6 ms; 24,000 shocks
Safety-related tests	IEC 61508 parts 1-7	Functional safety of electrical/electronic/programmable electronic safety-related systems
	EN 62061	Safety of machinery - Functional safety of electrical, electronic and programmable safety-related control systems
Chemical resistance	ISO 16750-5	AA, BA, BD, CC, DB, DC, DD, Only one chemical permitted at a time