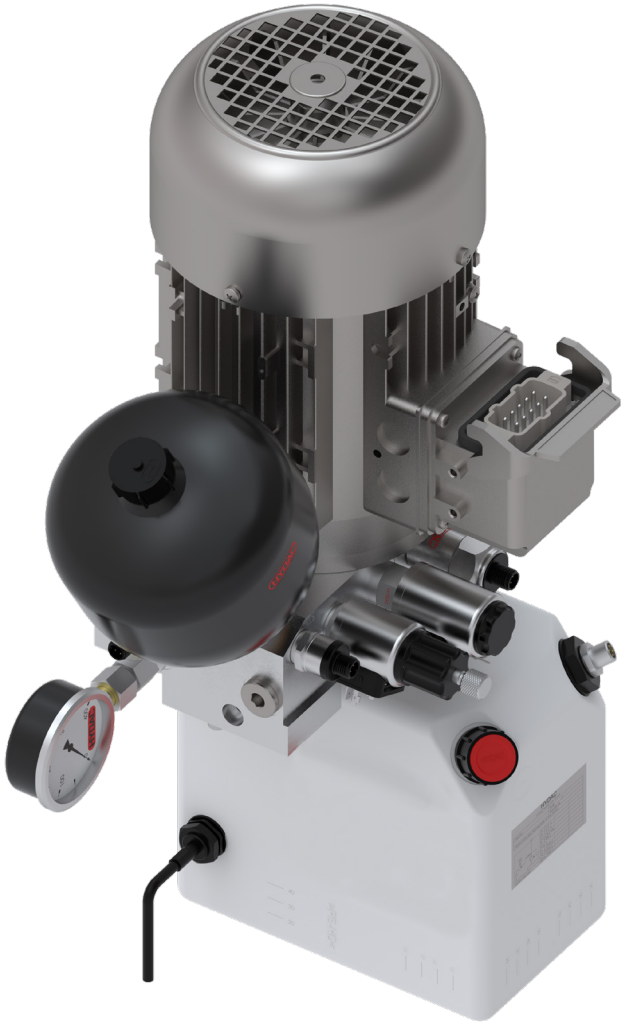
HYDAC INTERNATIONAL

IO-Link

Smart compact power unit CO1S

The smart drive unit with high power density

The smart compact power unit CO1S features very high power density combined with an extremely compact design. Thanks to the accumulator charging function, you can benefit from the energy efficiency of the drive unit. If the unit needs service, this can be detected early on by the integrated smart sensors that continuously monitor the condition and provide notification when the operating parameters are outside of the permitted limits.



Product advantages

- Smart sensor with IO-Link interface
- Condition monitoring and notification when operating parameters are outside of permitted range
- Automatable accumulator closing pressure measurement for p_0 assessment
- Pressure peak monitoring including logging
- Monitoring of power unit runtimes including operating hours counters
- Prevention of electrostatic discharge thanks to Stat-X® filter element technology

Technical data

P_{max} = up to 250 bar
Q_{max} = up to 12 l/min

According to EN 60034-1, suitable for:

Short-time duty:
S2 = 5 min*
(at 20 °C ambient temperature)

Intermittent duty:
S3 = 20 %*
(at 20 °C ambient temperature)

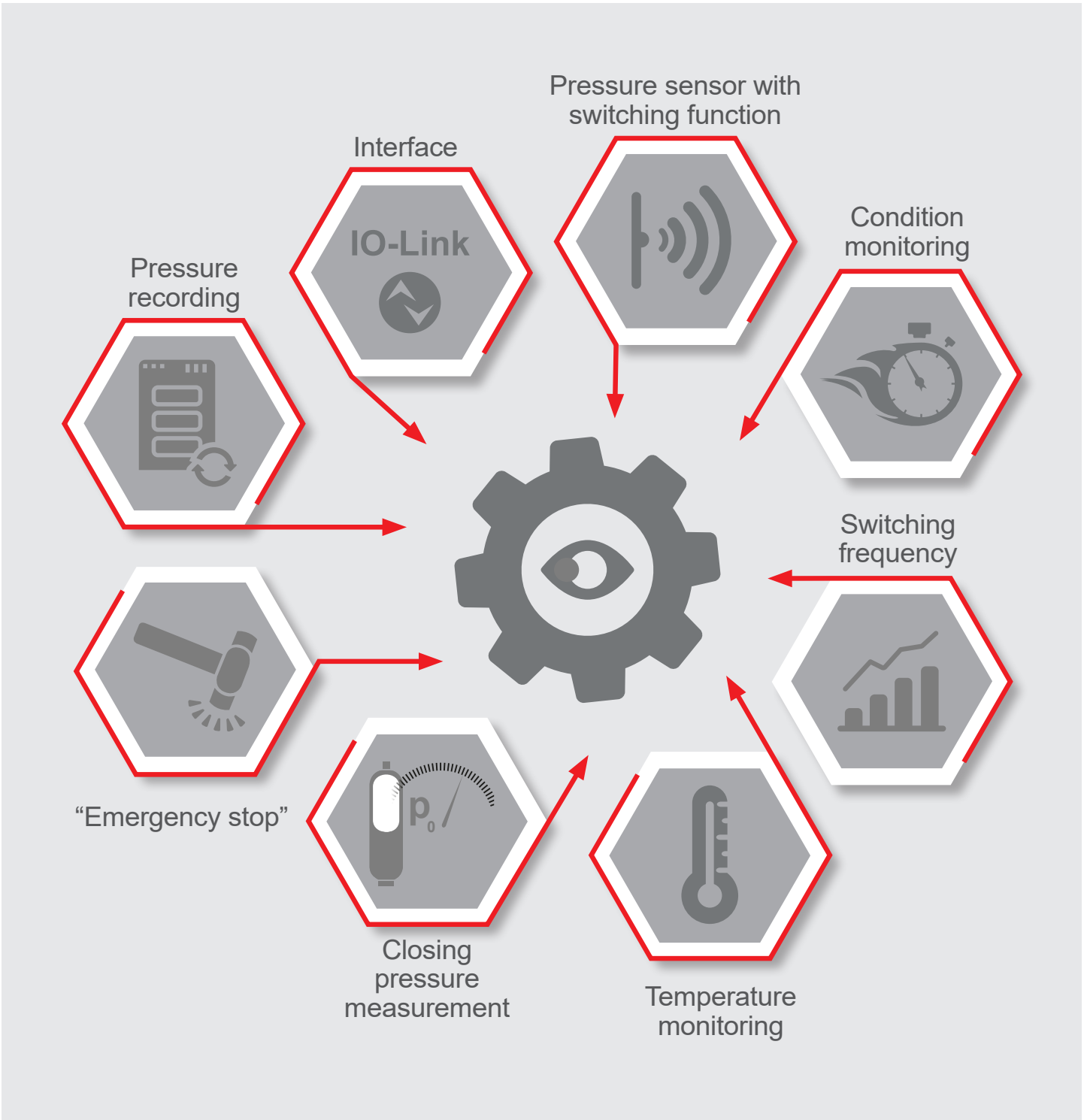
* Maximum oil temperature of 80 °C must not be exceeded

Product description, key facts

The smart compact power unit **CO1S** is used for fluid power supply in oil hydraulic systems in short-term operation and intermittent duty (S2, S3). It features high performance density combined with small dimensions. The accumulator charging function enables the required system pressure to be maintained for a long period after the drive unit has been switched off. Continuous condition monitoring of the unit is achieved by means of integrated smart sensors. The continuous data exchange between the unit and the machine controller is performed via IO-Link communication – whether it's condition monitoring, reporting that operating parameters are outside of the permitted limits or automatable accumulator closing pressure measurement for p_0 assessment.

The **CO1S** is the key to communication with your machine and a key component in total predictive maintenance (TPM).

Smart functions

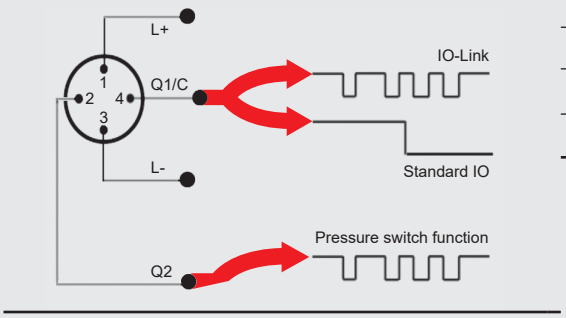


Explanatory table

Symbol	Designation	Explanation
	Pressure sensor with switching function	Pressure sensor for continuous pressure monitoring with custom-programmable switch point and defined hysteresis
IO-Link 	Interface	Communication standard IO-Link
	Condition monitoring	Surveillance and monitoring of the duty cycle of the unit (S2, S3), including operating hours counter for data evaluation
	Switching frequency	Surveillance and monitoring of the switching frequency of the unit (S2, S3) for data evaluation
	Temperature monitoring	Surveillance and monitoring of various temperature clusters of the unit for data evaluation, including switch-off if maximum permitted temperature is exceeded
	Closing pressure measurement (p_0 measurement)	Monitoring of the pre-charge pressure at the hydraulic accumulator
	“Emergency stop”	Unit switched off before system components or subsystems can be damaged
	Pressure sensing	Surveillance and monitoring of various pressure clusters of the unit for data evaluation and saving of maximum reached operating pressure (pressure peak measurement)

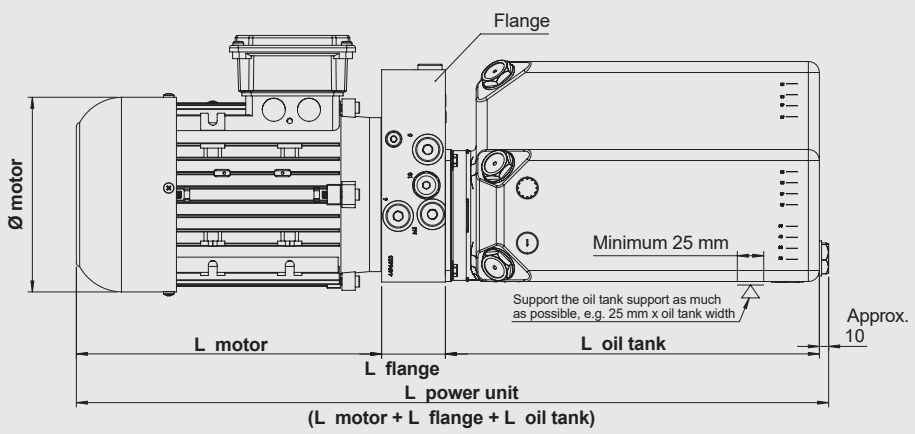
Terminal connections: smart pressure sensor / IO-Link communication

M12x1, 4-pole

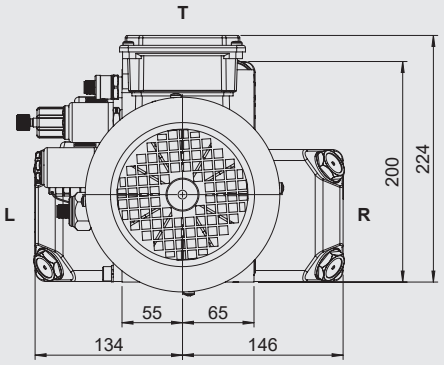


Pin	Signal	Description
1	L+	$+U_B$
2	Q2	Pressure switch function
3	L-	0 V
4	Q1/C	Switching output (SP1) / IO-Link communication

Dimensions



Side view



Front view

Motor data

P [kW]	No. of poles	L motor [mm]	ø motor [mm]
0.37	4	Approx. 220	141
0.55	4	Approx. 220	141
0.75	4	Approx. 220	141
1.1	4	Approx. 255	159
1.5	4	Approx. 255	159
2.2	2	Approx. 255	159
2.2*	4	Approx. 280	176
3*	2	Approx. 280	176

* On 2.2 and 3 kW motors the flange must have at least 15 mm of support. The motor protrudes.

Oil tank

Tank code	Filling volume / usable volume [l]*** Horizontal, tank position R and L	Horizontal tank position T**	Vertical	Tank length [mm]
B04	1.9 / 1.5	2.2 / 2.0	1.8 / 1.2	165* ± 5
B05	2.7 / 2.2	3.0 / 2.7	3.0 / 2.4	220* ± 5
B08	4.4 / 3.5	5.1 / 4.6	5.1 / 4.5	340* ± 5
B12	6.5 / 5.2	8.4 / 7.6	8.4 / 7.8	500* ± 5

* where mounted horizontally, support for oil reservoir must be provided by the customer – see dimensions

** cannot be selected if flangable option is to be added

*** the usable volume given is the maximum value (achieved with a clean suction filter, low to medium flow rate and viscous fluid!) Subject to modifications.

Flow rate and pressure

Flow rate				Motor power at 3 ~ 50 Hz 230/400 V, Motor also suitable for 3 ~ 60 Hz 257/480 V } motor code 03							Motor code 63 1 ~ 50 Hz / 230 V
50 Hz [l/min]	60 Hz [l/min]	No. poles on motor	V_g pump [ccm/rev]	0.37 kW [bar]	0.55 kW [bar]	0.75 kW [bar]	1.1 kW [bar]	1.5 kW [bar]	2.2 kW [bar]	3.0 kW [bar]	1.5 kW [bar]
1.3	**1.6**	4	1.0	**215**	**250**						250
2.4	**2.9**	4	2.0	**110**	**170**	**235**	**250**				250
3.7	**4.4**	4	2.65	**75**	**115**	**155**	**230**	**250**			230
5.0	**6.0**	4	3.75	**50**	**85**	**115**	**170**	**230**	**250**		180
6.3*	**7.6***	4	4.75*	**40**	**70**	**90**	**140**	**185**	**250**		140
7.4	**8.9**	2	2.65						**230**	**250**	
8.6*	**10.3***	4	6.3*	**30**	**50**	**65**	**100**	**130**	**200**		100
10.0	**12.0**	2	3.75						**165**	**230**	
12.0*		2	4.75*						**135**	**185**	
				4-pole motor types are low-noise							

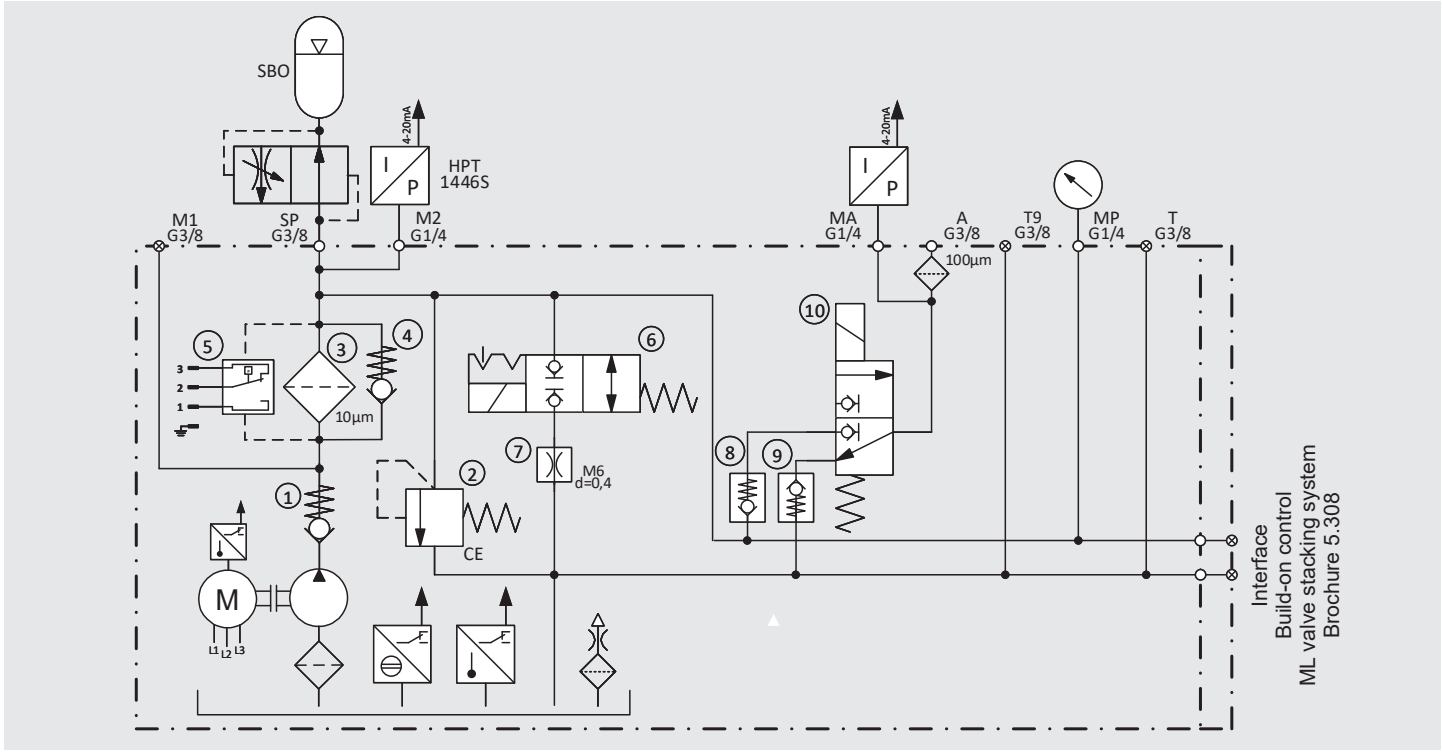
* not possible with oil tank B04

Exploded drawing

Other properties

Installation position: vertical, horizontal
Oil drain plug
Breather filter 30 µm
Plastic oil tank (see point Oil tank) in PE, semi-transparent with oil level markings
Depending on the application, provide as much support as possible
Do not expose to direct sunlight over long periods
Flange can be expanded optionally with ML modules (brochure no. 5.308) to enable realisation of the large number of different hydraulic controls

Circuit diagram



Model code

	Power unit	Flange control	Attachments / valve voltage / build-on control
Example	CO1S V B05 L TSÖ LS 2.4-170-03-TSM	-MFS21-E-R-W-C R RT-CE160	SP/SBO10-M2/HPT-MA1-24DG+ML

Power unit

CO1S V B05 L TSÖ LS 2.4-170-03-TSM

Power unit series

Installation position of unit (see Fig. page 8)
H = horizontal
V = vertical

Oil tank (see Tab. page 4)
B04 / B05 / B08 / B12

Power unit tank orientation (see Fig. page 8)
L left / **R** right
T top (mounting of horizontal stacking assembly not possible)

Temperature switch
0 = without temperature switch
TSM = temperature switch, motor
TSÖ = temperature switch, oil, set temperature 80 °C

Level switch
0 = without level switch
LS = level switch

Flow rate + pressure (see Tab. page 4)

Motor supply voltage (see Tab. page 4)
03 / 63 / ... others on request

Flange control

-MFS21-E-R-W-C R RT-CE160

Filter + check valve + pressure relief valve

MFS21 = Pressure filter filtration rating 10 µm (no. 3) / CV (no. 1) / PRV (no. 2)

Clogging indicator (no. 5)

0 = without clogging indicator
A = visual indicator
C = electrical indicator
AE = visual + electrical indicator (15–30 V DC/AC)
For further details, see brochure no. 7.050

Check valve, bypass (no. 4)

R = check valve (approx. 10 bar)
0 = plug

Valves (no. 6)

DV = mechanical accumulator discharge (DV5E)
V = WSM 06020 V
W = WSM 06020 W (required for closing pressure measurement)
WN = WSM 06020 W-01M ... with manual override
0 = screw plug

Valves (no. 10)

C = WSM08130C
D = WSM08130D
DN = WSM08130D..01M... with manual override
0 = screw plug

Check valve (no. 8)

R = check valve
0 = without

Check valve (no. 9)

RT = check valve in return flow
0 = without

Pressure relief valve (no. 2)
e.g. **CE160** = DB4E ... CE (CE approved) set to 160 bar

Model code

Attachments / valve voltage / build-on control

SP/SBO10-M2/HPT-MA1-24DG+ML

Accumulator

SBO1	=	accumulator SBO210-0,16
SBO3	=	accumulator SBO210-0,32
SBO5	=	accumulator SBO210-0,5
SBO7	=	accumulator SBO210-0,75
SBO10	=	accumulator SBO210-1
SBO14	=	accumulator SBO210-1,4
SBO20	=	accumulator SBO210-2,0
SBO35	=	accumulator SBO210-3,5

Closing pressure measurement

HPT 1446S	=	Differential pressure transmitter

Attachment parts

M	=	Minimess

DS1	=	mech. press. sw. 10–100 bar (without connector)
DS2	=	mech. press. sw. 50–200 bar (without connector)
EDS3	=	EDS 3446-2-250-000
EDS8	=	EDS 8446-2-250-000

MA1	=	pressure gauge Ø 63 mm incl. threaded connection 160 bar
MA2	=	pressure gauge Ø 63 mm incl. threaded connection 250 bar
MA4	=	pressure gauge Ø 63 mm incl. threaded connection 400 bar

F	=	filter possible at port A and B

HPT 1446S	=	Differential pressure transmitter

Valve voltage

24DG	=	24 V DC coil without connector (standard)
230AG	=	230 V AC coil without connector (standard)
24DG-Z4	=	24 V with connector Z4 (no connector no details)

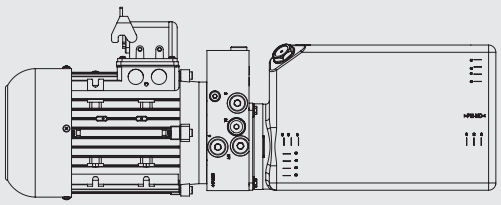
Build-on control

ML	=	valve stacking system from the ML range (see brochure no. 5.308)

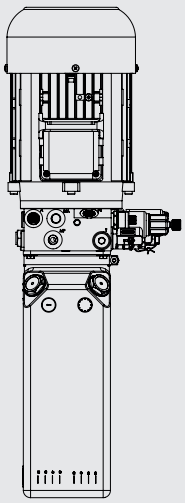
Alignment options

Mounting orientation

H = horizontal

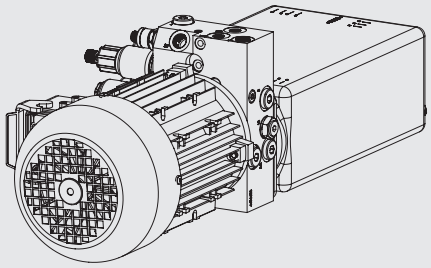


V = vertical

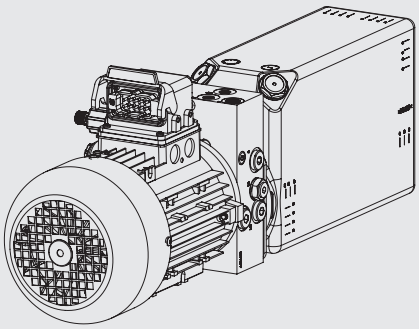


Mounting position

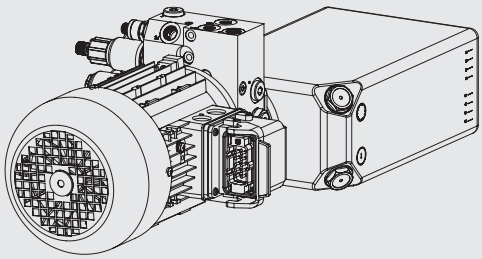
L = left



T = top

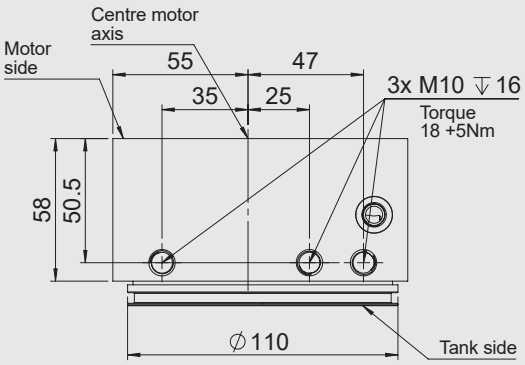


R = right



NOTICE: Tank orientation T not possible if ML stacking system is to be added.

Mounting technology



Safety information and documentation

Safety information for operation

- Do not use the power unit for anything other than its intended purpose
- Do not exceed maximum permitted operating pressure
- Ensure adequate ventilation for heat dissipation
- Power units and add-on equipment can become hot during operation – risk of injury!
- Refer also to HYDAC instruction manual drawing no. 3111722

Requirements at the installation site

- Permitted ambient temperature range -20 °C to +40 °C
- Do not mount power unit onto moving parts
- Finish required on mounting surface 0.3 mm over 100 mm length
- To avoid excessive noise, use anti-vibration mounts and avoid mounting on resonating surfaces
- To prevent vibration transfer, hoses must be used wherever possible when connecting the power unit
- Do not install in a thermally insulated environment

Note

The information in this brochure relates to the operating conditions and applications described.

For applications and/or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

HYDAC Fluidtechnik GmbH
Justus-von-Liebig-Str.
66280 Sulzbach/Saar
Germany
Tel.: +49 68 97 / 509-01
E-mail: powerpack@hydac.com