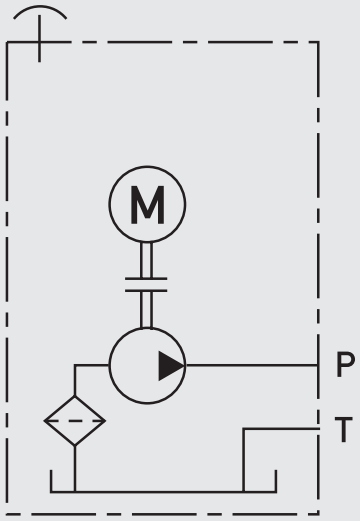
HYDAC INTERNATIONAL

HYDAC (Three-Phase Current) Compact Power Units CO1



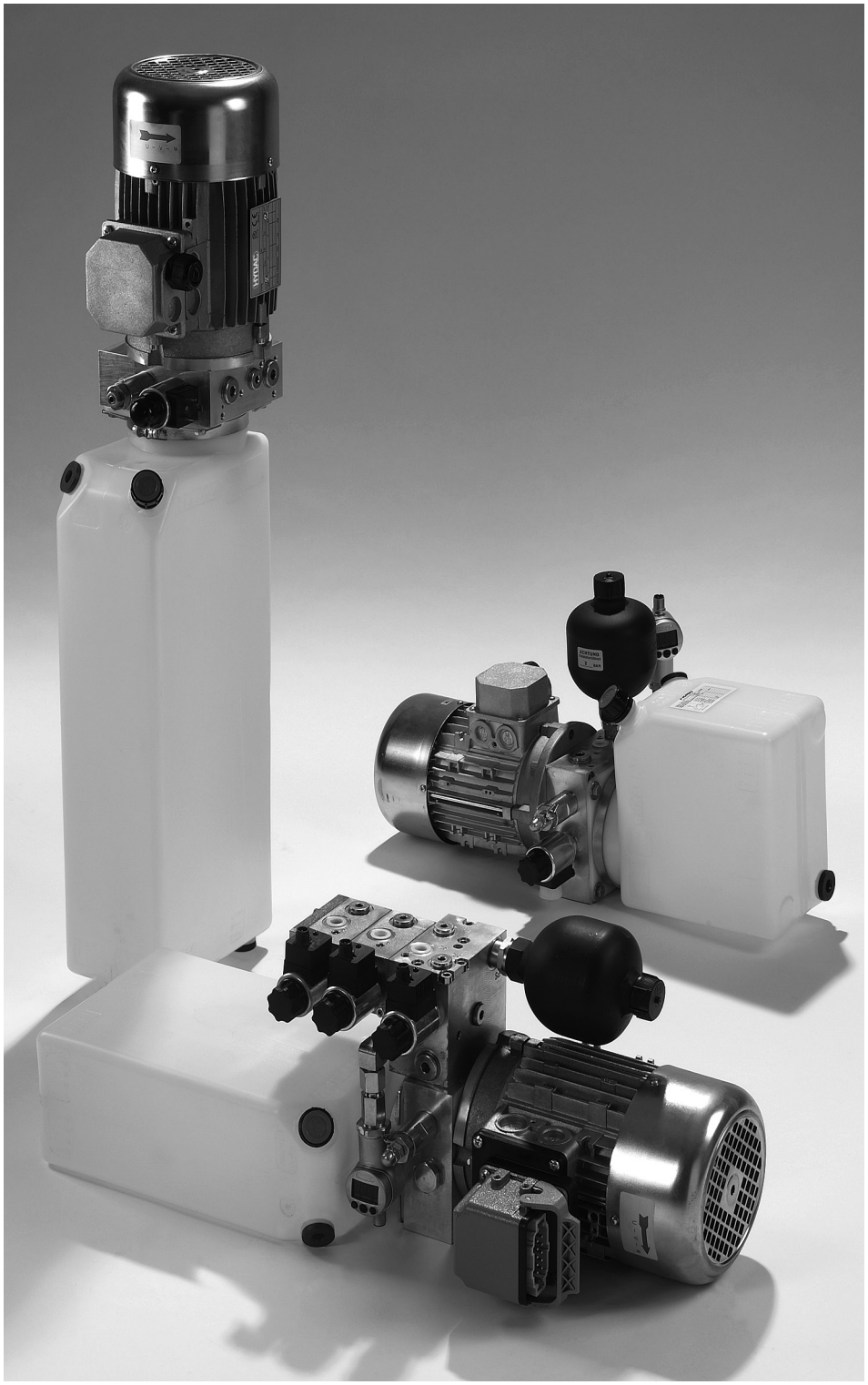
Up to 250 bar
Up to 20 l/min

In accordance with EN 60034-1 suitable for:

Short-term operation:
S2 = 5 min* (average value)

Intermittent operation:
S3 = 20 %* (average value)

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



E 5.306.1/01.13

1. TECHNICAL SPECIFICATIONS

1.1 GENERAL

- Very low noise levels due to special construction
- Space-saving design due to small flange
- Possibility of different hydraulic controls in the same flange due to flexible configuration of cartridge valves and / or fitting of control blocks and serial function modules

1.2 SAFETY INSTRUCTIONS

Observance of the safety instructions is of the utmost importance.
Before commissioning, the safety instructions must be read and followed without fail – see point 7!
Failure to observe these instructions will invalidate the product warranty.

1.3 HYDRAULIC SPECIFICATIONS

Flow rate Q	Up to 20.0 l/min
Continuous pressure	Up to 250 bar
Peak pressure	Up to 300 bar (on request) (possible with a reduced number of cycles depending on pump size!)
Motor	0.37 – 3.0 kW standard (4.0 and 5.5 kW on request)
Protection class	DIN EN 60034-5 min IP 54
Pump displacement	1.0 – 10 cm3
Tank volume	Usable volume 1.2 l – 7.8 l
Duty cycle	S2 (short-term operation) approx. 5 min S3 (intermittent operation) approx. 20 %
Operating fluid	Mineral oil to DIN 51524 Part 2
Temperature range of operating fluid	min. –20 °C to max. +80 °C
Viscosity range	min. 10 mm²/s – max. 380 mm²/s
Filtration	Operating fluid to ISO 4406 Class 21/19/16 or cleaner
Ambient temperature	–20 °C to +40 °C
Return flow rate	Up to maximum 40 l/min

1.4 MECHANICAL AND ELECTRICAL SPECIFICATIONS

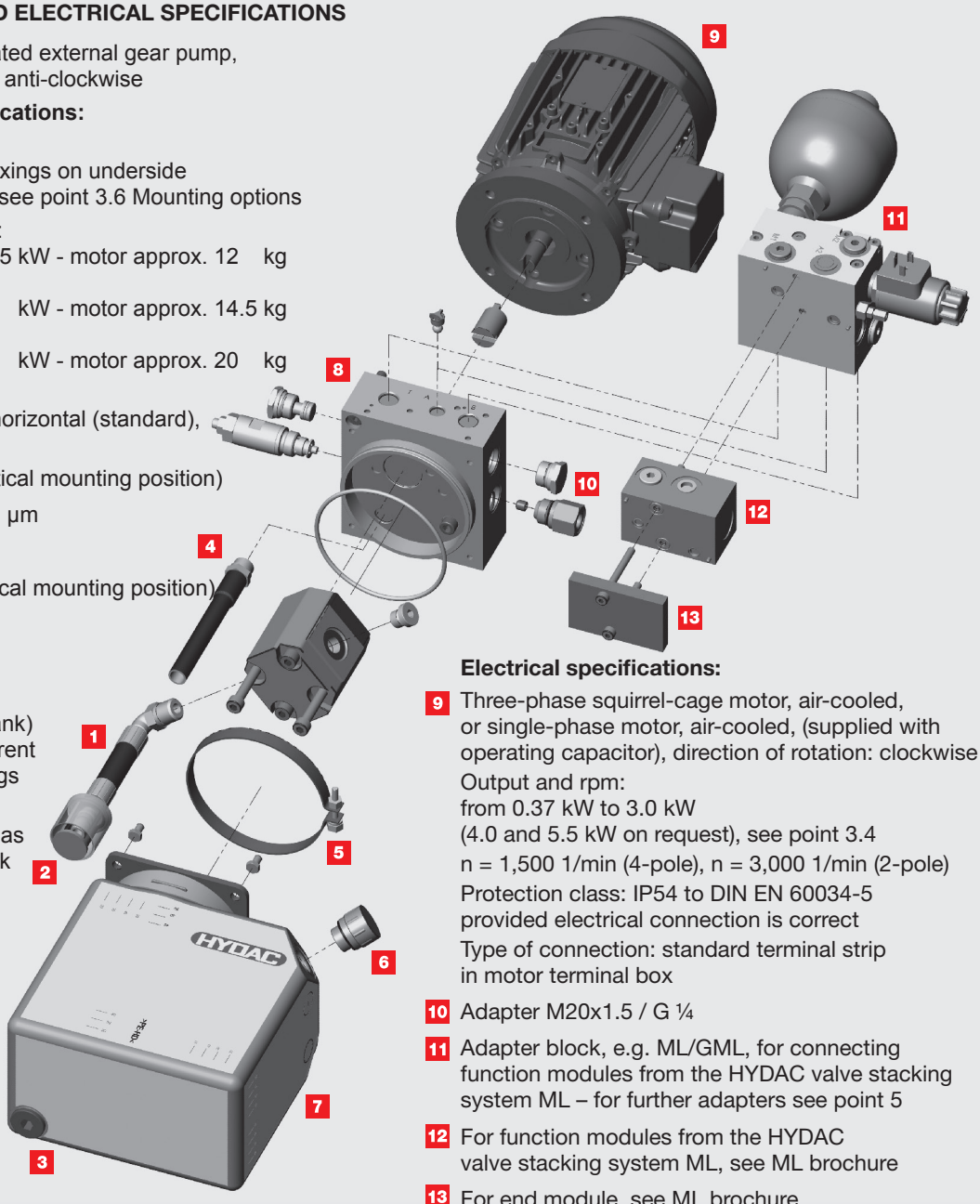
Pressure-compensated external gear pump, direction of rotation: anti-clockwise

Mechanical specifications:

Type of mounting:
2 x M10 (min. 8.8) fixings on underside of mounting flange, see point 3.6 Mounting options

Weight of basic unit:
CO1 with 0.37 – 0.55 kW - motor approx. 12 kg (dry unit)
CO1 with 0.75 – 1.5 kW - motor approx. 14.5 kg (dry unit)
CO1 with 2.2 – 3.0 kW - motor approx. 20 kg (dry unit)

Mounting position: horizontal (standard), vertical possible



1. Suction line (for vertical mounting position)
2. Suction strainer 350 µm
3. Oil drain plug
4. Return line (for vertical mounting position)
5. Clamp
6. Breather filter
7. Plastic oil tank (see point 3.3, Oil tank) in PE, semi-transparent with oil level markings
   - depending on the application, provide as much support to tank as possible (see point 3.5)
   - do not expose to direct sunlight over long periods
8. Flange enables a variety of different hydraulic controls due to versatile configuration of cartridge valves – see point 4 for application examples

Electrical specifications:

9. Three-phase squirrel-cage motor, air-cooled, or single-phase motor, air-cooled, (supplied with operating capacitor), direction of rotation: clockwise
   Output and rpm:
   from 0.37 kW to 3.0 kW
   (4.0 and 5.5 kW on request), see point 3.4
   n = 1,500 1/min (4-pole), n = 3,000 1/min (2-pole)
   Protection class: IP54 to DIN EN 60034-5 provided electrical connection is correct
   Type of connection: standard terminal strip in motor terminal box
10. Adapter M20x1.5 / G ¼
11. Adapter block, e.g. ML/GML, for connecting function modules from the HYDAC valve stacking system ML – for further adapters see point 5
12. For function modules from the HYDAC valve stacking system ML, see ML brochure
13. For end module, see ML brochure

2. MODEL CODE

Power unit | Flange controls | Build-on-controls | Valve voltage | Adapter block

Example **CO1 H B05 R - 2.4 - 250 - 03 - M23-0DV - 250V210 + ML + 24DG – Z4 + B1/ML ...**

Type of power unit

Mounting position, see point 3.1
- **H** = horizontal
- **V** = vertical

Oil tank, see point 3.3
- **B04** = length 165 mm
- **B05** = length 220 mm
- **B08** = length 340 mm
- **B12** = length 500 mm

Tank / motor orientation, see point 3.2
- **L** = left
- **R** = right
- *__T__ = top

*not if an adapter block is to be fitted

Flow rate, see point 3.4

Maximum pressure, see Point 3.4

Motor code
- **03** = 3-phase 230 / 400 V – 50 Hz
- **03** = 3-phase 254 / 460 - 480 V – 60 Hz
- **63** = single phase 230 V – 50 Hz

Special voltages on request (min. 10 pieces)

Flange control, see point 4
- **M23-0DV** = see overview of flange controls
- **250V** = pressure relief valve DB, pressure range and type of adjustment
- **210** = DB pre-set to 210 bar, no details: not pre-set

Build-on controls **ML** = with valve stacking system ML, no details: no stacking system

Valve voltage
- **24DG** = 24 V DC without connector (standard)
- **230AG** = 230 V AC without connector
- **Z4** = with connector, no details: no connector

Adapter block, see point 5

Required for connecting ML stacking system or directional valve NG6

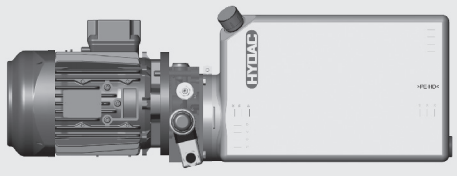
Build-on valves or controls

e.g. valve stacking system ML or directional valve NG6 to DIN 24340 Form A, ISO 4401

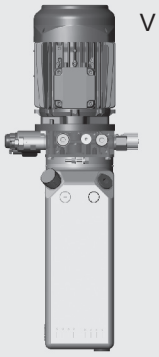
3. TECHNICAL SPECIFICATIONS AND DIMENSIONS

3.1 MOUNTING POSITION OF POWER UNIT

H = horizontal

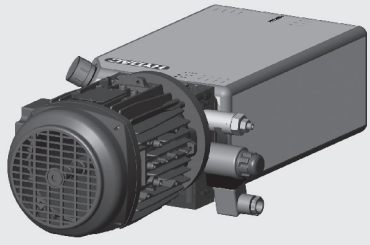


V = vertical

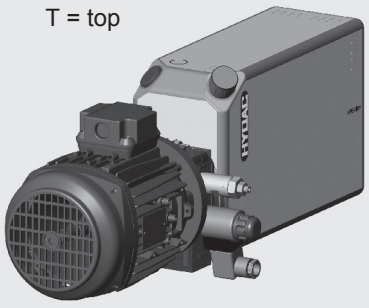


3.2 MOUNTING ORIENTATION OF OIL TANK AND MOTOR TERMINAL BOX

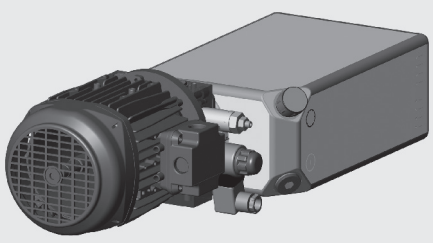
L = left



T = top



R = right



3.3 OIL TANK

	Filling volume / usable volume [l]***			
Tank code	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

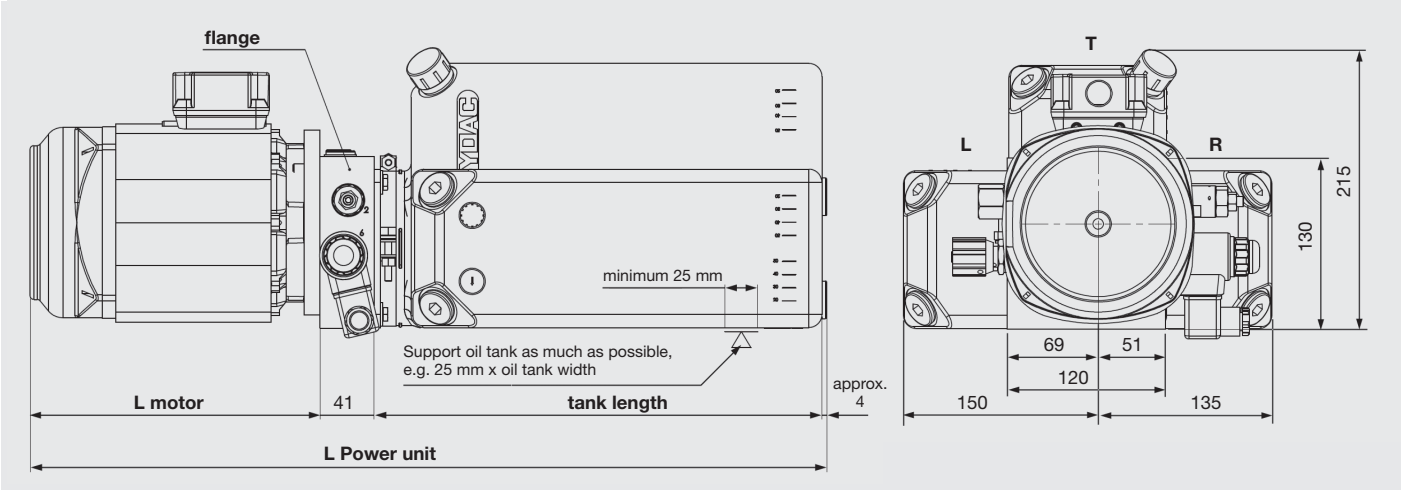
* where mounted horizontally, support for oil tank must be provided by the customer – see dimensions
** cannot be selected if adapter blocks are to be fitted (see point 5)
*** The usable volume given is the maximum value (will be achieved with a clean suction filter, low to medium flow rate and viscous fluid!)
Subject to modifications.

3.4 FLOW RATE AND PRESSURE

Flow rate				Motor output 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. of poles on motor	Pump displ. [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**	
12.6*	15.1*	2	4.75*						**135**	**185**	
13.3*	16.0*	4	10.0*		**30**	**40**	**60**	**85**	**120**		**65**
17.3*	20.7*	2	6.3*						**95**	**130**	
20.0*		2	8.0*						**80**	**110**	
				4-pole motor types are low-noise							

* not possible with oil tank B04

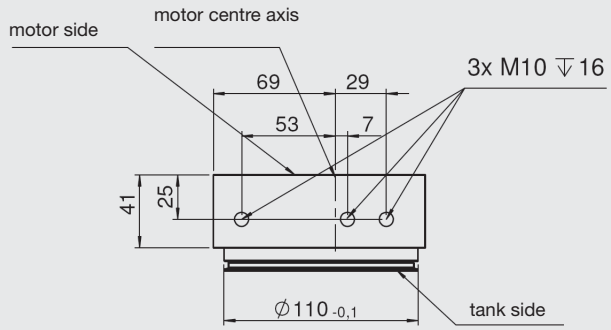
3.5 DIMENSIONS



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

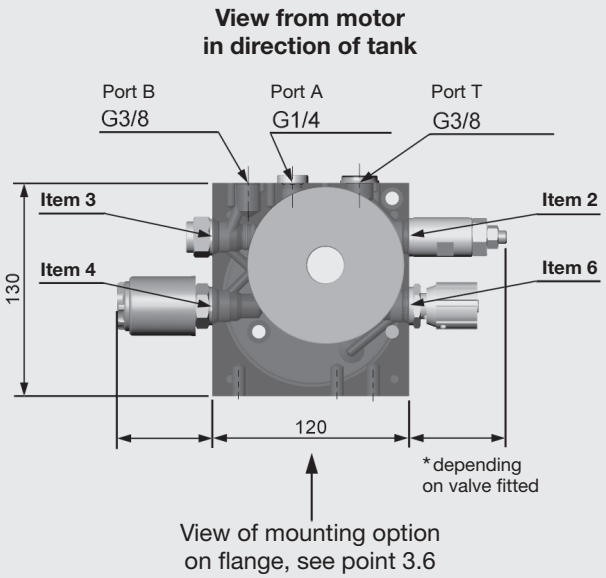
* On 2.2 and 3 kW motors the flange must have at least 15 mm of support.

3.6 MOUNTING OPTIONS ON FLANGE UNDERSIDE



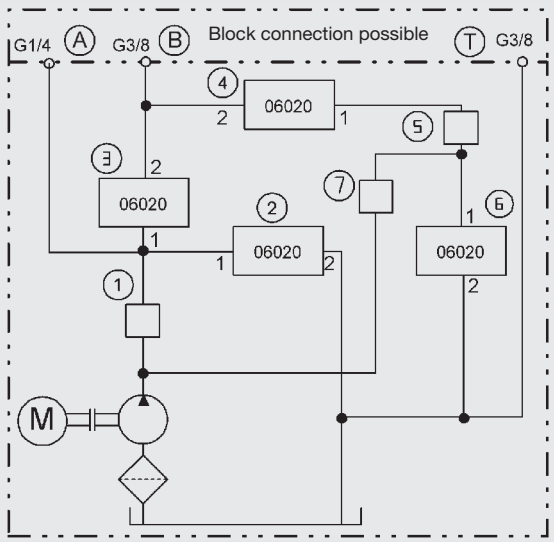
Torque for fixing screws 40 Nm,
Minimum screw quality 8.8

3.7 FLANGE DIMENSIONS



View of mounting option
on flange, see point 3.6

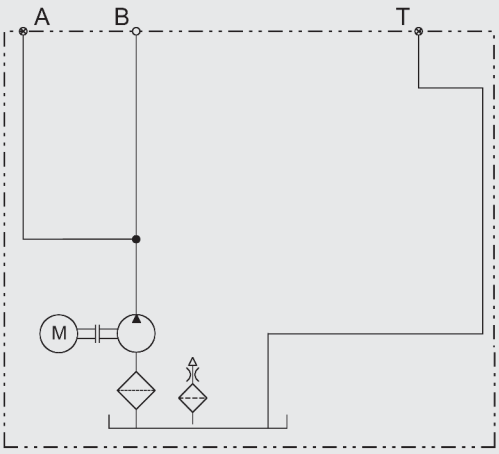
3.8 CAVITIES IN CO1 FLANGE



Item ① = Cavity for RV mounting kit
Item ②③④⑥ = Cavity 06020 for valves
Item ⑤⑦ = Cavity for blanking plugs

4. FLANGE CONTROLS

4.1 BASIC CONTROL M00



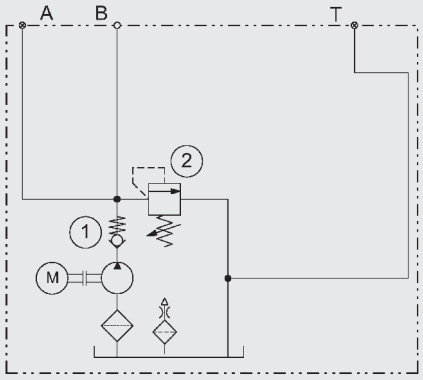
Ports:
A = G 1/4
B and T = G 3/8

M 0 0
Flange version
without DB
without RV

4.2 BASIC CONTROL M21

M 2 1

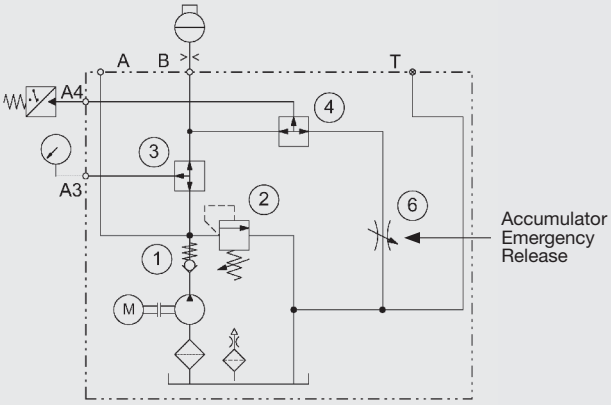
Flange version
with pressure relief valve, item 2
with check valve, item 1



Ports:
A = G 1/4, B and T = G 3/8

Example: **M21-A3 A4 DV-CE210-MA2-EDS3-SBO3**

Supplied loose, see point 6.

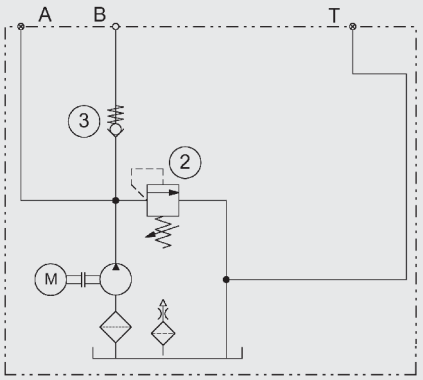


Ports:
A = G 1/4, B and T = G 3/8
A3 and A4 = G 1/4
(Adapter M 20 x 1.5-G 1/4)

4.3 BASIC CONTROL M23 / M61

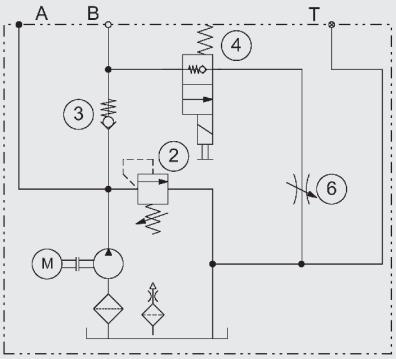
M 2 3

Flange version
with pressure relief valve, item 2
with check valve, item 3



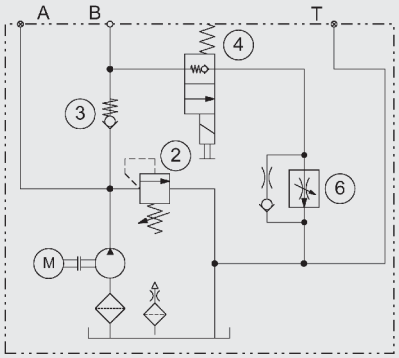
Ports:
A = G 1/4, B and T = G 3/8

Example: **M23-ZNDV-250V**



Ports:
A = G 1/4
B and T = G 3/8

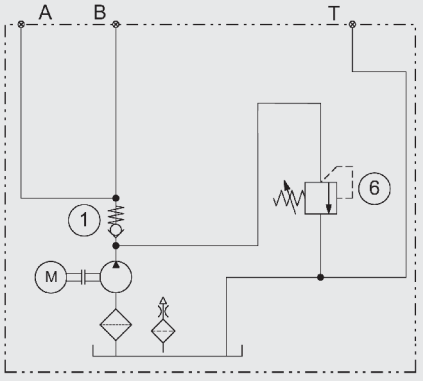
Example: **M23-ZN SR2.5-250V**



Ports:
A = G 1/4
B and T = G 3/8

M 6 1

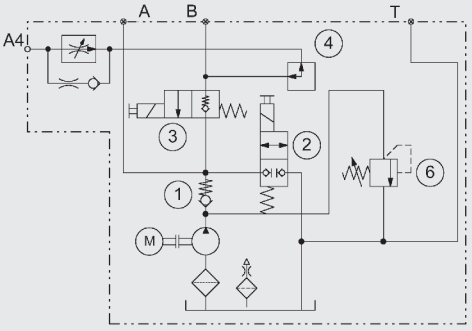
Flange version
with pressure relief valve, item 6
with check valve, item 1



Ports:
A and A4 = G 1/4, B and T = G 3/8

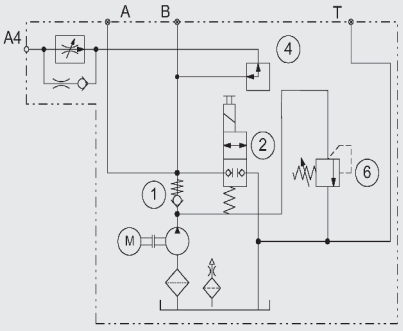
Example: **M61-WNZN-A4/S4.0-250V200**

Unpressurized circulation



Ports:
A and A4 = G 1/4
B and T = G 3/8

Example: **M61-WN0-A4/S4.0-250V200**



Ports:
A and A4 = G 1/4
B and T = G 3/8

ACCUMULATOR CHARGING CONTROL

Example: **M 2 1 - A3 A4 DV - CE210 + 24DG**

Flange version

Item 2 Pressure relief valve DB4E

Item 1 Check valve EBS RV06

Item 3 Blanking plug **0**
Port with adapter M20x1.5 / G1/4 **A3**

Item 4 Blanking plug **0**
Port with adapter M20x1.5 / G1/4 **A4**

Item 6 Blanking plug **0**
Needle valve DV5E **DV**
WSM06020W...01M...with manual override **WN**
WSM06020V... **V**

DB4E...CE...type-approved **CE210**
Pressure setting DB4E e.g. 210 bar

Valve voltage
24 V DC = **24DG**
230 V AC = **230AG**

For more detailed information on add-on equipment for A3 / A4, see point 6.

For further technical details on valves see:

DB4E	Brochure no. E 5.161 and 5.163
DV5E	Brochure no. E 5.113
WSM 06020	Brochure no. E 5.949

LIFT/LOWERING CONTROLS

Example: **M 2 3 - ZN DV - 250V + 24DG**

Flange version

Item 2 Pressure relief valve DB4E

Item 3 Check valve RVM06020

Item 4 Blanking plug **0**
Adapter M20x1.5 / G1/4 **A4**
WSM06020Z **Z**
WSM06020Z...01M...with manual override (standard) **ZN**
WSM06020Y **Y**
WSM06020W...01M...with manual override (standard) **WN**

Item 6 Blanking plug **0**
Needle valve DV5E (standard) **DV**
Pressure comp. flow control valve SR5E **SR**
WSM06020V **V**
WSM06020W **W**
WSM06020W...01M...with manual override (standard) **WN**

Pressure relief valve not pre-set (pmax 250 bar)

Valve voltage
24 V DC = **24DG**
230 V AC = **230AG**

For further technical details on valves see:

DB4E	Brochure no. E 5.161
RVM 06020	Brochure no. E 5.193
DV5E	Brochure no. E 5.113
WSM 06020	Brochure no. E 5.949
SRE	Brochure no. E 5.118
SR5E	Brochure no. E 5.117.4

Example: **M 6 1 - WNZN - A4/S4.0 - 250V200 + 24DG**

Flange version

Item 6 Pressure relief valve DB4E

Item 1 Check valve EBS RV06

Item 2 No details = no directional valve **0**
WSM06020W... **W**
WSM06020W...01M...with manual override **WN**
WSM06020V... **V**

Item 3 No details = no directional valve **0**
Adapter M20x1.5 / G1/4 **A3**
WSM06020Z... **Z**
WSM06020Z...01M...with manual override **ZN**

Item 4 No details = no port A4 **0**
Port with adapter M20x1.5 / G1/4 **A4**
Adapter with pressure comp. flow control valve SRE1 (fitted), see point 6.1 **A4 / S4.0**

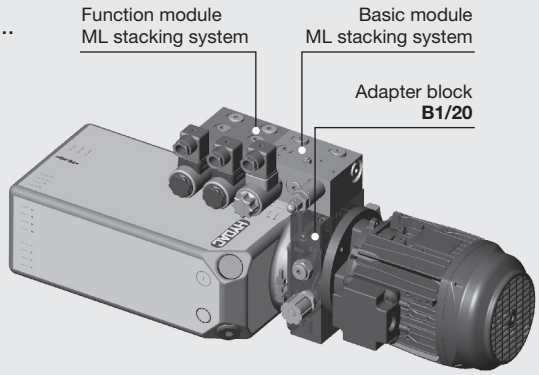
Pressure relief valve (p_{max} 250 bar) 200 bar pre-set

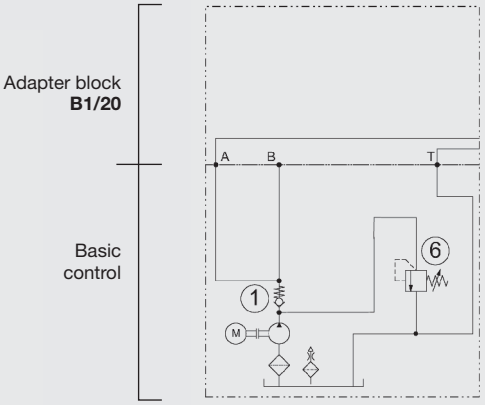
Valve voltage
24 V DC = **24DG**
230 V AC = **230AG**

5. ADAPTER BLOCKS

Type:
CO1...M61...ML...**+ B1/20 +**...

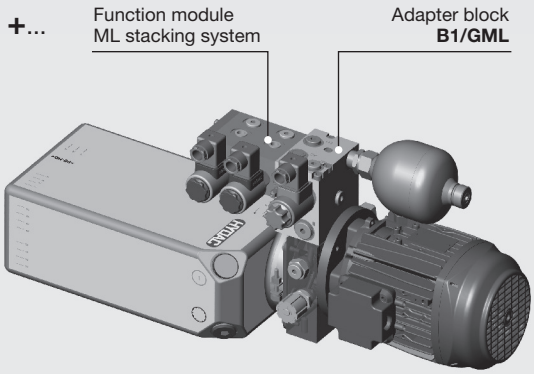
Block for mounting
basic modules
from the HYDAC
valve stacking system ML
(see ML brochure E 5.308.0)

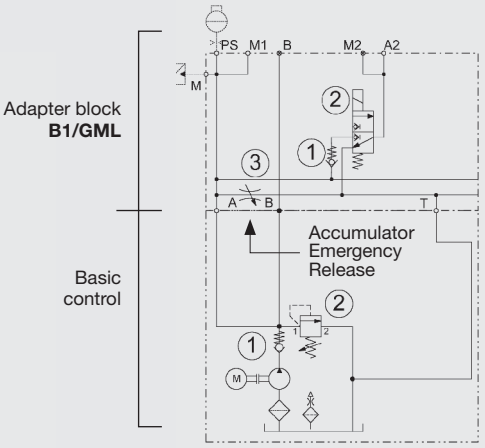




Type:
CO1...M21...ML...**+ B1/GML +**...

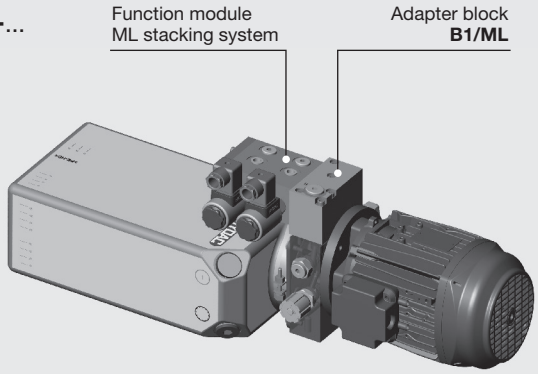
Block for mounting
function modules
from the HYDAC
valve stacking system ML
(see ML brochure E 5.308.0)
suitable for optional
mounting of an accumulator,
with manually-operated
pressure release

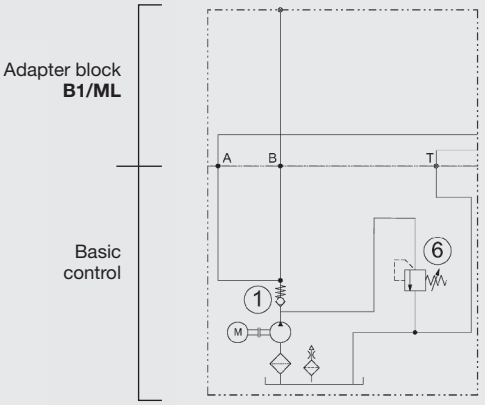




Type:
CO1...M61...ML...**+ B1/ML +**...

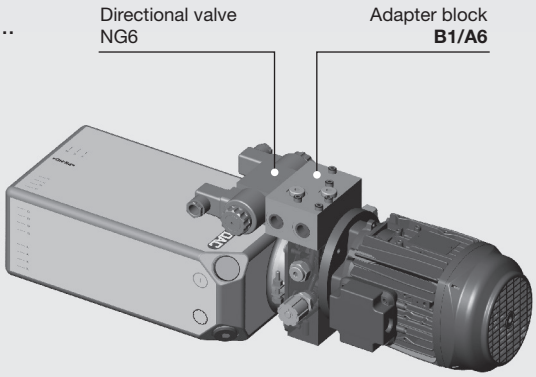
Block for mounting
function modules
from the HYDAC
valve stacking system ML
(see ML brochure E 5.308.0)

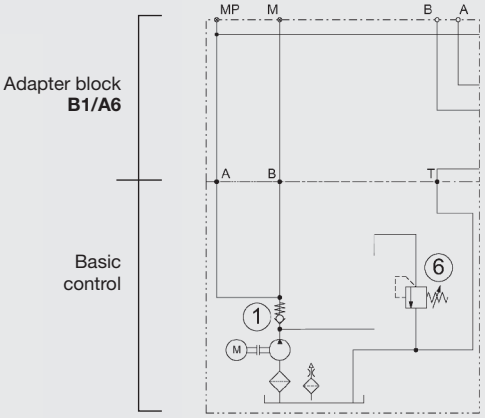




Type:
CO1...M61...ML...**+ B1/A6 +**...

Block for mounting
directional valves,
nominal size 6
in accordance with
DIN 24340 Form A, ISO 4401.
When fitting
several directional valves,
extension module 3A6
is required
(see ML brochure E 5.308.0)

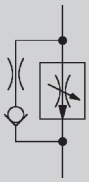




6. ADD-ON EQUIPMENT FOR A, B, A3, A4 (on A3, A4 with adapter M20x1.5 / G1/4)

Example **CO1... ...SBO3-MA2-EDS3**

6.1 FLOW CONTROL VALVES - supplied fitted - (only on A3, A4)



S1.6	Pressure compensated flow control valve SRE1 with pre-set flow rate = (Part No. 3055053)	1.6 l/min
S2.5	Pressure compensated flow control valve SRE1 with pre-set flow rate = (Part No. 3055131)	2.5 l/min
S4.0	Pressure compensated flow control valve SRE1 with pre-set flow rate = (Part No. 554533)	4.0 l/min
S5.0	Pressure compensated flow control valve SRE1 with pre-set flow rate = (Part No. 558362)	5.0 l/min
S6.0	Pressure compensated flow control valve SRE1 with pre-set flow rate = (Part No. 554534)	6.0 l/min
S8.0	Pressure compensated flow control valve SRE1 with pre-set flow rate = (Part No. 554535)	8.0 l/min
S10.0	Pressure compensated flow control valve SRE1 with pre-set flow rate = (Part No. 554536)	10.0 l/min

For further technical details, see brochure no. E 5.118

6.2 PRESSURE SWITCHES - supplied loose -

DS1	Mechanical pressure switch	10 – 100 bar
DS2	Mechanical pressure switch	50 – 200 bar
DS4	Mechanical pressure switch	100 – 400 bar
EDS3	Electronic pressure switch EDS3446-2-250-000	up to 250 bar

For further technical details on the EDS 3000, see brochure no. E 18.060

6.3 PRESSURE GAUGES - supplied loose -

MA1	Pressure gauge Ø 63 – 160 bar
MA2	Pressure gauge Ø 63 – 250 bar
MA4	Pressure gauge Ø 63 – 400 bar
M	Minimess - supplied fitted -

6.4 ACCUMULATORS - supplied loose -

SBO1	Accumulator SBO210-0.16
SBO3	Accumulator SBO210-0.32
SBO5	Accumulator SBO210-0.5
SX	Accumulator, give full details
AS	Accumulator adapter with orifice Ø 2.0 mm

For further technical details on the SBO see brochure no. E 3.100

7. SAFETY INSTRUCTIONS AND DOCUMENTATION

7.1 SAFETY INSTRUCTIONS DURING OPERATION

- The power unit must only be used for its intended purpose
- Do not exceed maximum permitted operating pressure
- Ensure adequate ventilation for heat dissipation
- Do not mount power unit onto moving parts
- Power units and add-on equipment can get hot during operation – risk of injury
- Refer also to HYDAC Operating Instructions and drawing no. 3111722

7.2 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 flexible mounts and avoid mounting on resonating surfaces
- To prevent vibration transfer, hoses must be used wherever possible when connecting the power unit

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