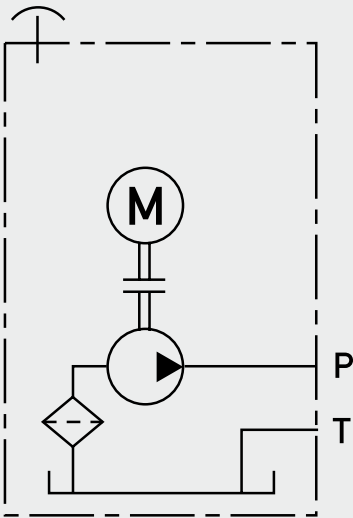


HYDAC (Three-Phase Current) Compact Power Units CO1



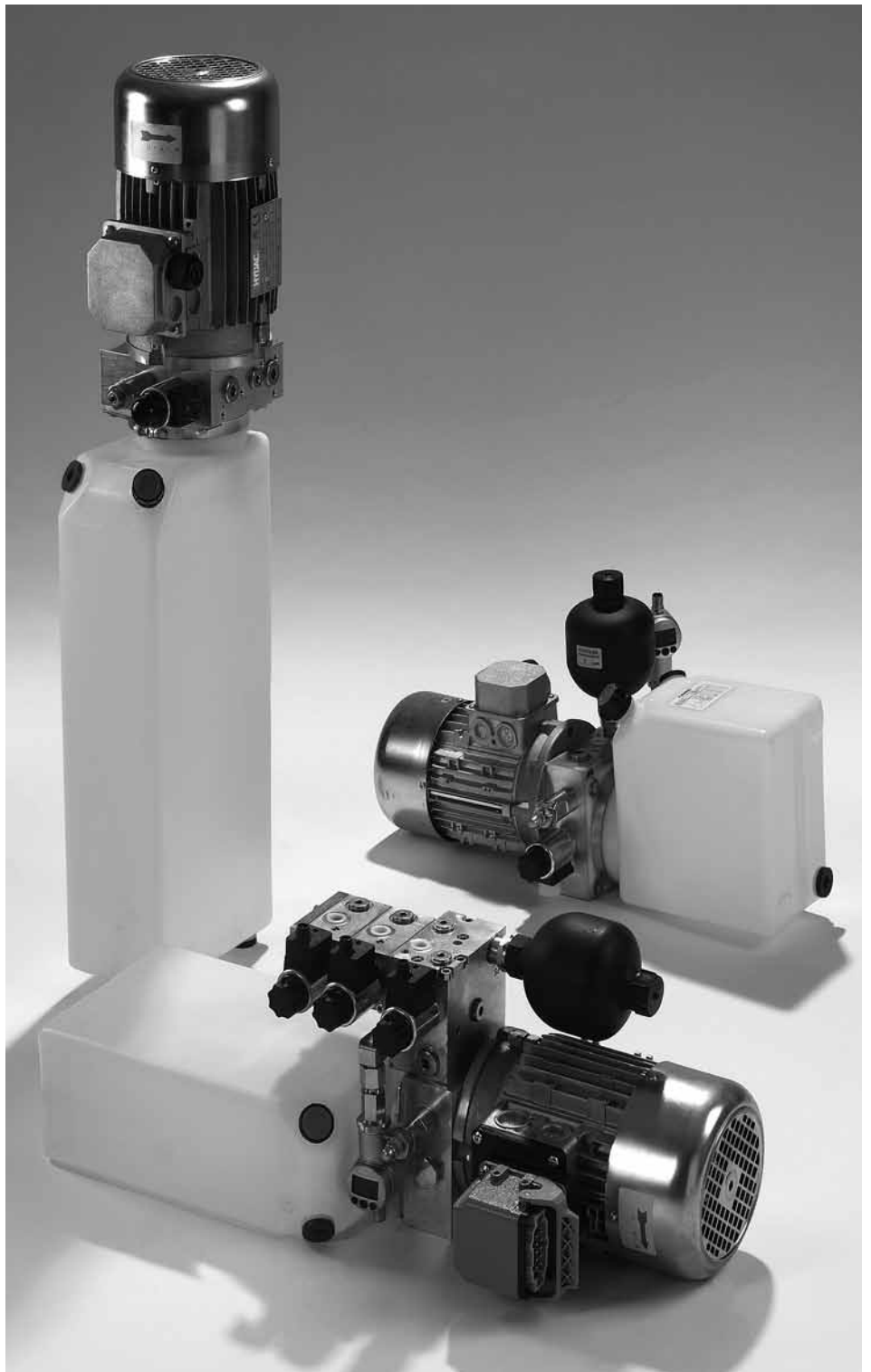
Up to 250 bar
Up to 20 l/min

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



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 cm ³
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 mm ² /s – max. 380 mm ² /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

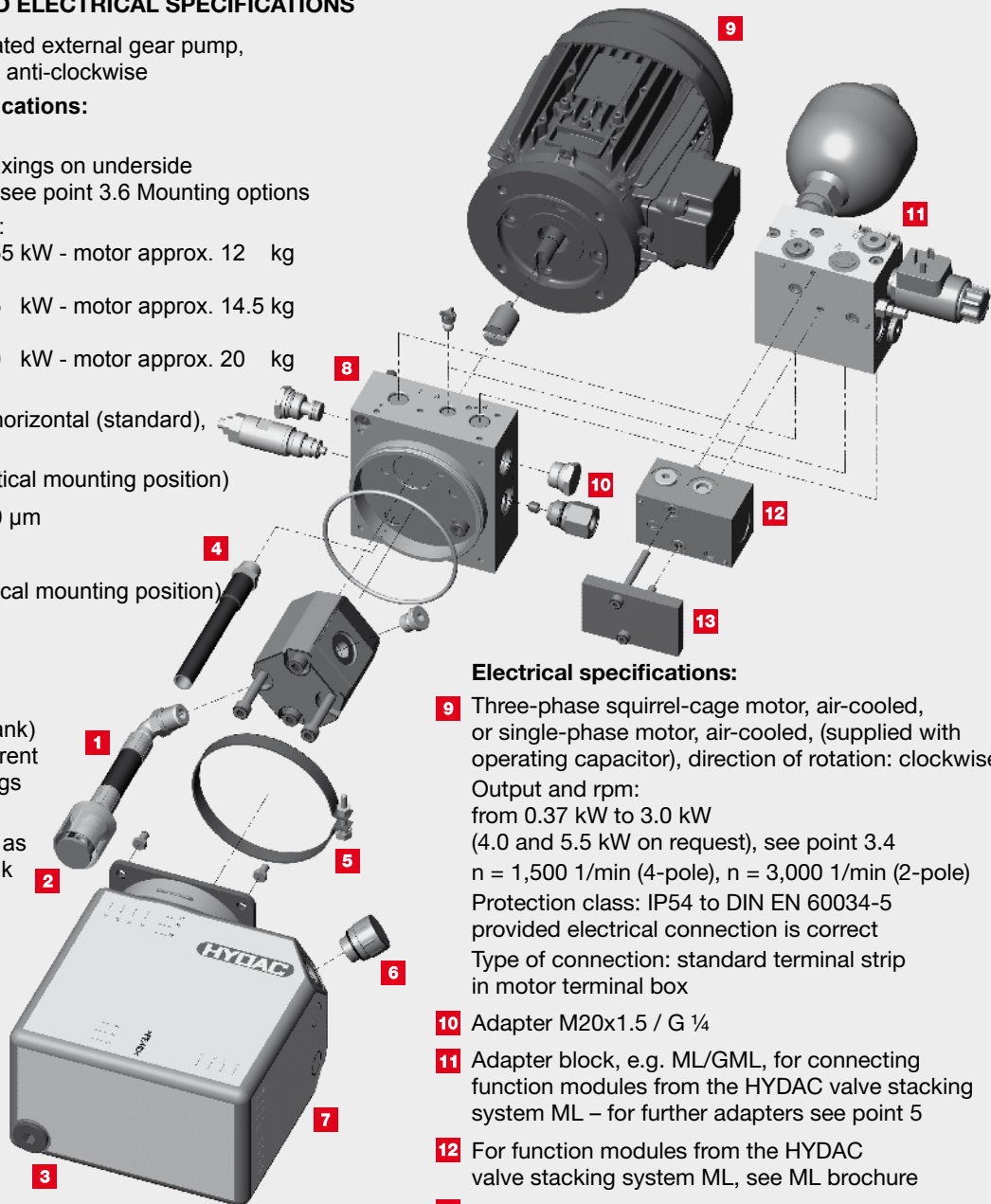
Mechanical specifications:

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:

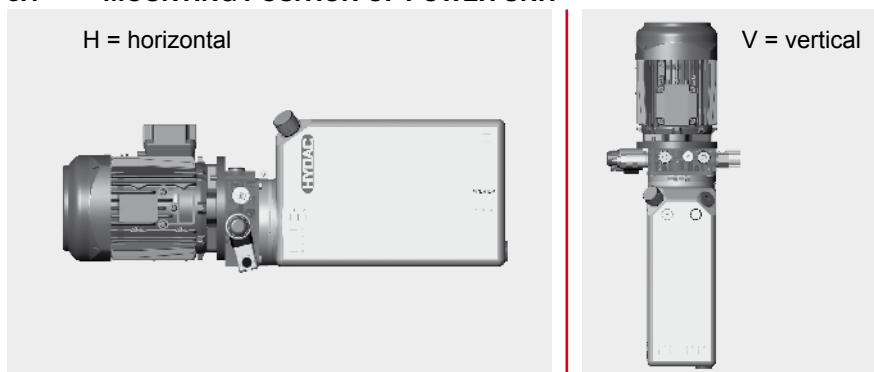
- 9 Three-phase squirrel-cage motor, air-cooled, or single-phase motor, air-cooled, (supplied with operating capacitor), direction of rotation: clockwise
Output and rpm:
from 0.37 kW to 3.0 kW
(4.0 and 5.5 kW on request), see point 3.4
n = 1,500 1/min (4-pole), n = 3,000 1/min (2-pole)
Protection class: 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 1/4
- 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

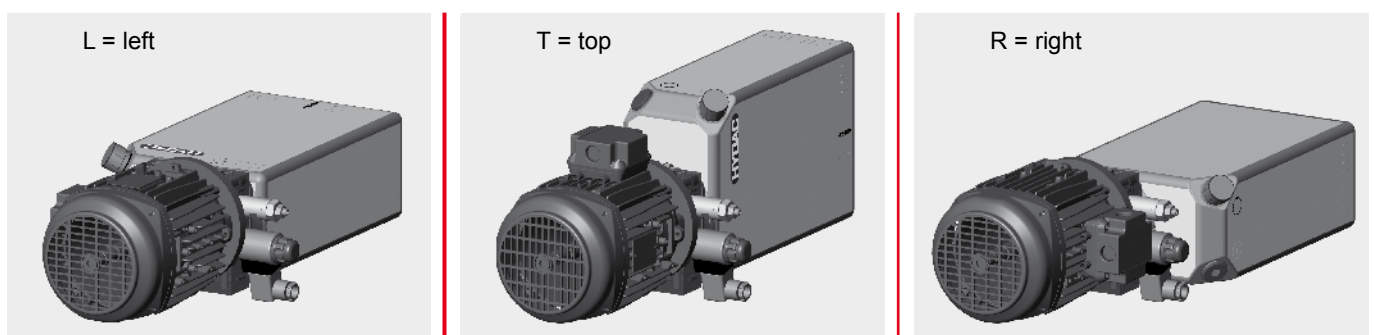
	Power unit	Flange controls	Build-on controls	Valve voltage	Adapter block
Example	CO1 H B05 R - 2.4 - 250 - 03	- M23-0DV - 250V210	+ ML	+ 24DG - Z4	+ B1/ML ...
Type of power unit	CO1				
Mounting position, see point 3.1	H				
	H = horizontal				
	V = vertical				
Oil tank, see point 3.3	B05				
	B04 = length 165 mm				
	B05 = length 220 mm				
	B08 = length 340 mm				
	B12 = length 500 mm				
Tank / motor orientation, see point 3.2	R				
	L = left				
	R = right				
	*T = top				
	*not if an adapter block is to be fitted				
Flow rate, see point 3.4	2.4				
Maximum pressure, see Point 3.4	250				
Motor code	03				
	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				
	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	ML				
	ML = with valve stacking system ML, no details: no stacking system				
Valve voltage	24DG				
	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	B1/ML				
	Required for connecting ML stacking system or directional valve NG6				
Build-on valves or controls	Z4				
	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



3.2 MOUNTING ORIENTATION OF OIL TANK AND MOTOR TERMINAL BOX



3.3 OIL TANK

Tank code	Filling volume / usable volume [l]**			Tank length [mm]
	Horizontal tank position R and L	Horizontal tank position T**	Vertical	
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!)

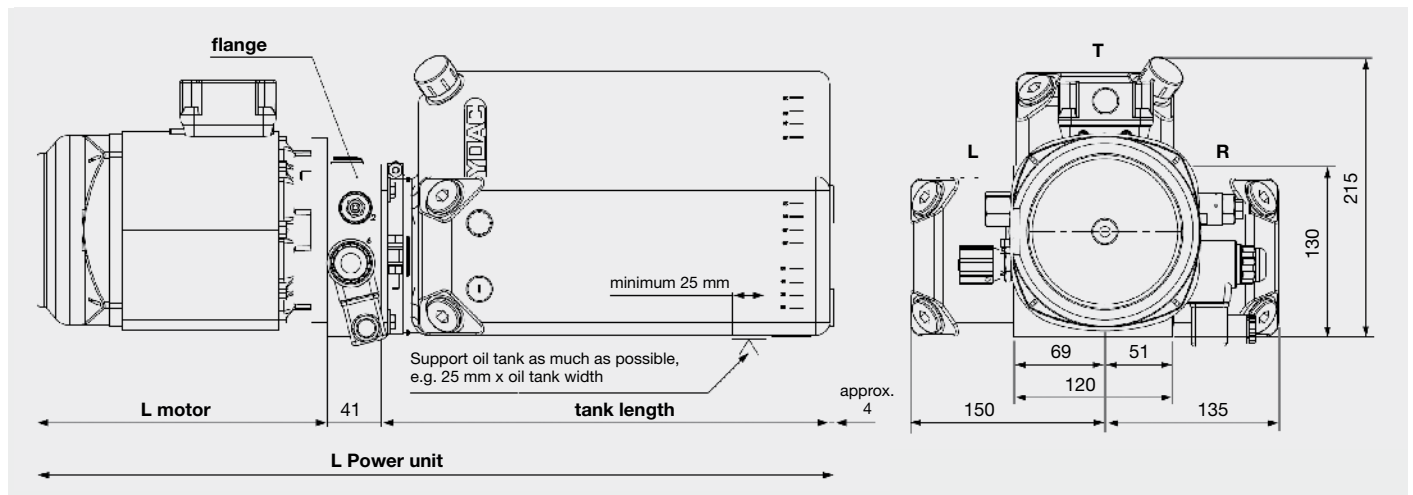
Subject to modifications.

3.4 FLOW RATE AND PRESSURE

Flow rate		No. of poles on motor	Pump displ. [ccm/rev.]	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]			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

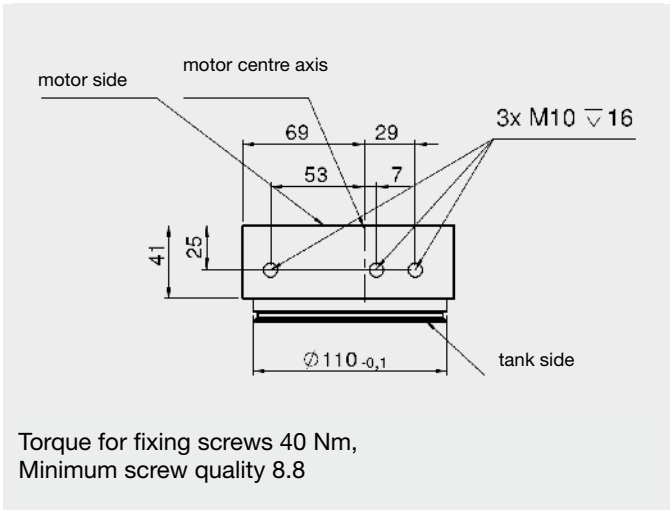
3.5 DIMENSIONS



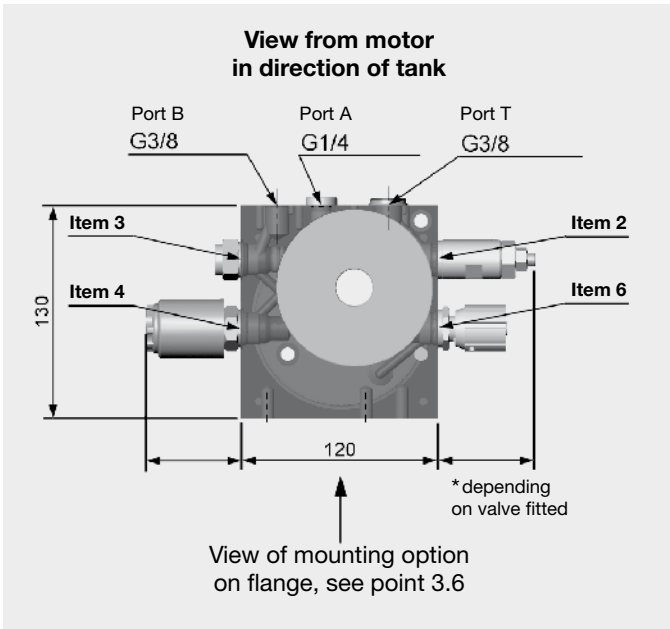
P [kW]	No. of poles	L Motor [mm]	ø Motor [mm]
0.37	4	approx. 220	141
0.55	4	approx. 220	141
0.75	4	approx. 220	141
1.1	4	approx. 255	159
1.5	4	approx. 255	159
2.2	2	approx. 255	159
2.2*	4	approx. 280	176
3*	2	approx. 280	176

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

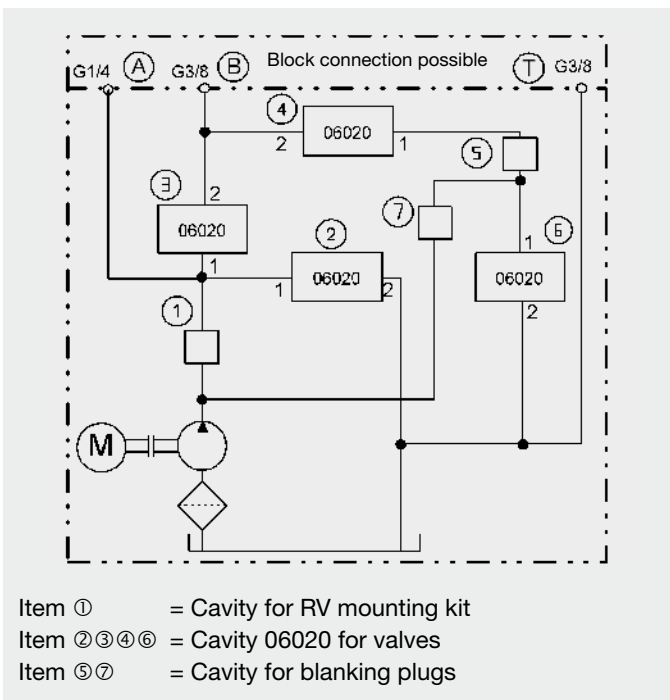
3.6 MOUNTING OPTIONS ON FLANGE UNDERSIDE



3.7 FLANGE DIMENSIONS

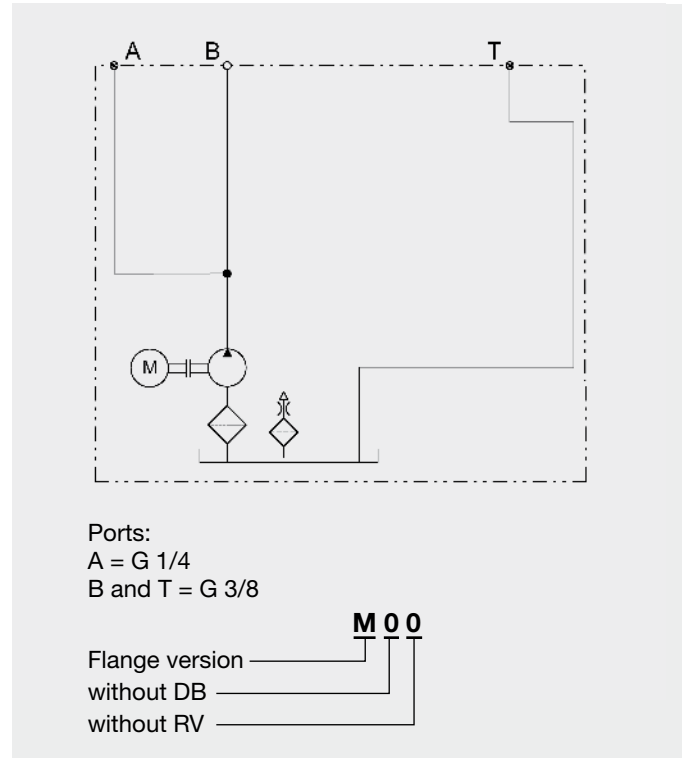


3.8 CAVITIES IN CO1 FLANGE



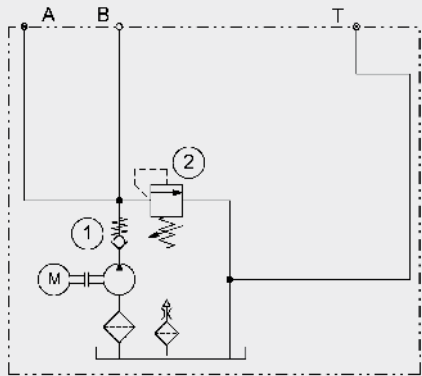
4. FLANGE CONTROLS

4.1 BASIC CONTROL M00



4.2 BASIC CONTROL M21

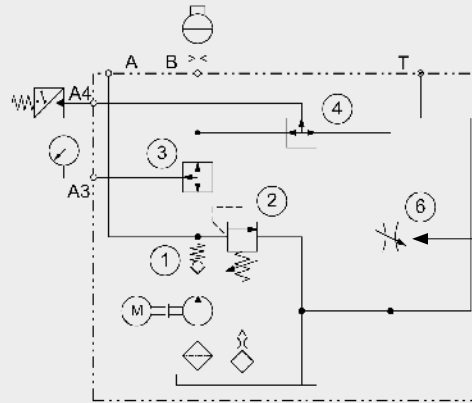
Flange version **M 2 1**
 with pressure relief valve, item 2
 with check valve, item 1



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.

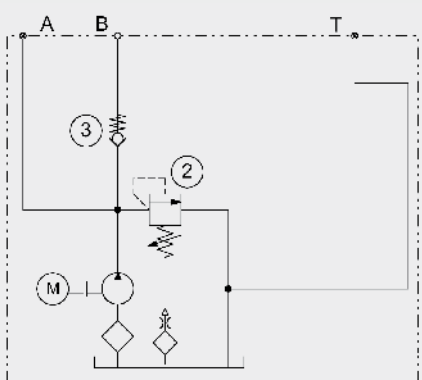


Accumulator
Emergency
Release

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)

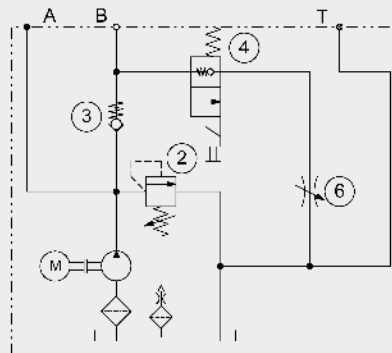
4.3 BASIC CONTROL M23 / M61

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



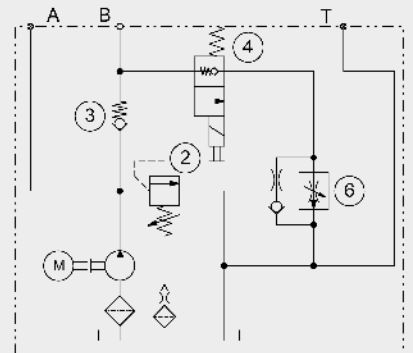
Ports:
 A = G 1/4, B and T = G 3/8

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



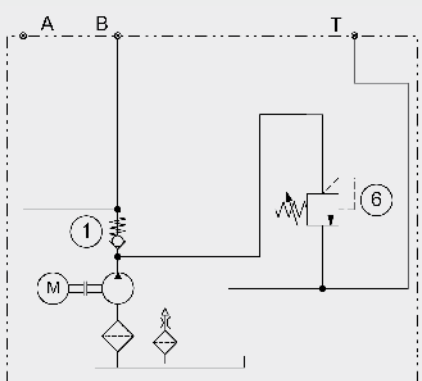
Ports:
 A = G 1/4
 B and T = G 3/8

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



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

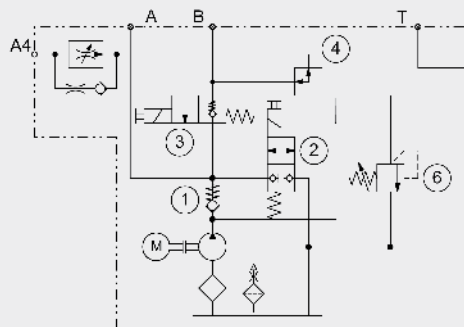
Flange version **M 6 1**
 with pressure relief valve, item 6
 with check valve, item 1



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

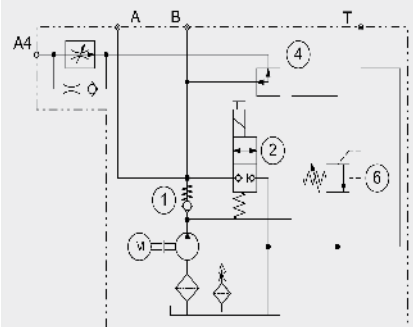
Example: **M61-WNZN-A4/S4.0-250V200**

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**

Item	Description	Code
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**

Item	Description	Code
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 (p _{max} 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

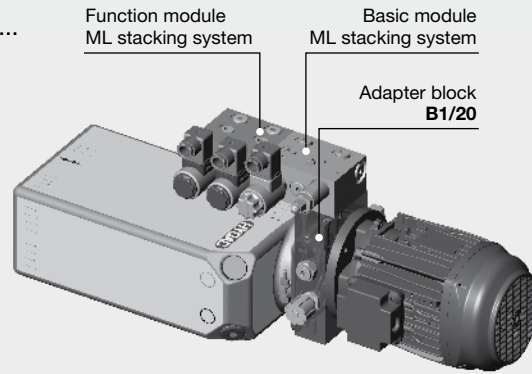
Example: **M 6 1 - WNZN - A4/S4.0 - 250V200 + 24DG**

Item	Description	Code
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	A4 /
	SRE1 (fitted), see point 6.1	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

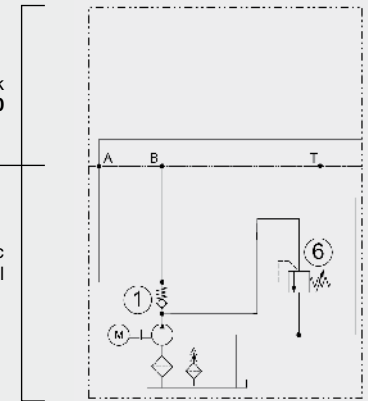
Type:
CO1...M61...ML...+ **B1/20** +...

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



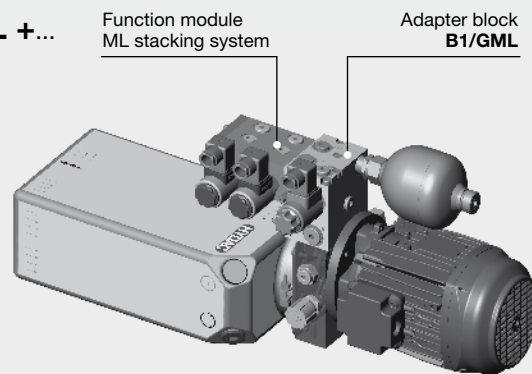
Adapter block
B1/20

Basic control



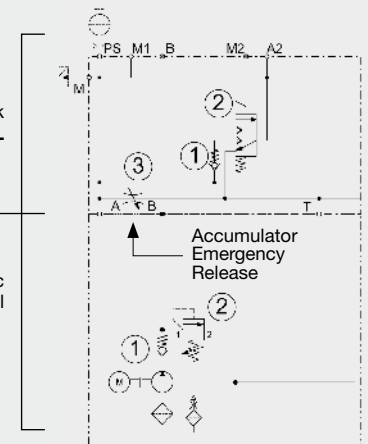
Type:
CO1...M21...ML...+ **B1/GML** +...

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



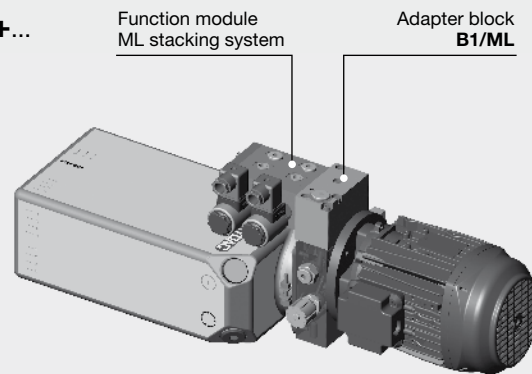
Adapter block
B1/GML

Basic control



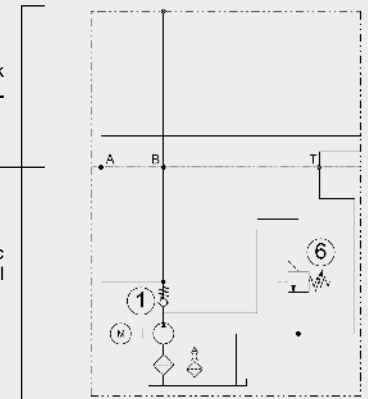
Type:
CO1...M61...ML...+ **B1/ML** +...

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



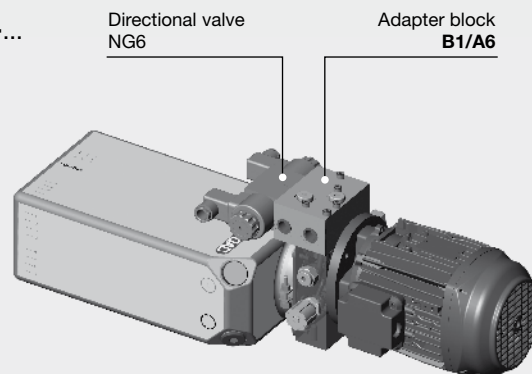
Adapter block
B1/ML

Basic control



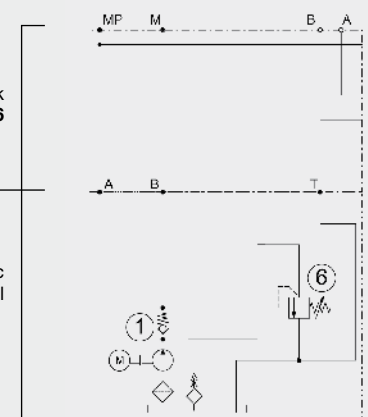
Type:
CO1...M61...ML...+ **B1/A6** +...

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)



Adapter block
B1/A6

Basic control

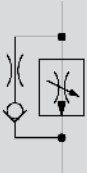


6. ADD-ON EQUIPMENT FOR A, B, A3, A4 (on A3, A4 with adapter M20x1.5 / G1/4)

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



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

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

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

Subject to technical modifications.

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E-Mail: flutec@hydac.com

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