RE 51045
Edition: 2025-08

rexroth
A Bosch Company

Compact Hydraulic Power Unit

Type: innoCube

- 1X Component series
- Power 1.5 ... 4kW
- Maximum operating pressure 250bar
- Maximum flow 40L/min

Features

- Integrated frequency converter
- Power 1.5 ... 4.0 kW with identical frame size and interfaces
- Warning signals for oil level, temperature, and frequency converter faults
- Plug-and-play (electrical connection via plug)
- Built-in oil cooler (air-cooled or water-cooled options)
- Noise reduction design
- Reduced oil volume due to degassing-optimized tank
- Compact design
- Pre-start control to reduce pressure drop
- Sleep function to reduce the power consumption, e.g., during accumulator charging operation

Contents

Ordering code

01	02	03	04	05	06	07	08	09	10	11	12	13
innoCube	**–**	**1X**	**/**	**18**	**/**	**SF**			**/**	**2**	**/**		**/**		**/**		**/**		**/**		**/**	*****

01	Compact hydraulic power unit	**innoCube**
02	Component series 10 ... 19 (10 ... 19: unchanged mounting and connection dimensions)	**1X**
Tank size		
03	18 liters	**18**
Drive		
04	Synchronous motor with frequency converter - pressure closed-loop control	**SF**
Power rating		
05	1.5 kW	**1**
	2.2 kW	**2**
	3.0 kW	**3**
	4.0 kW	**4**

Pump		**Displacement**	
06	Size 4	4 cm^3	**P04**
	Size 5	5.5 cm^3	**P05**
	Size 8	8 cm^3	**P08**
	Size 11 [1)]	10.9 cm^3	**P11**
	Size 13 [2)]	13 cm^3	**P13**
	Size 16 [3)]	16 cm^3	**P16**

07	Maximum working pressure (see pQ curves on pages 6-7)	**2**
Data interface		
08	Basic type (analog interface)	**B**
	Advanced type (Ethernet interface RJ45)	**P**
Cooling type		
09	Oil-air cooler (0.6 ... 1.7kW, see cooling power curve on page 5) [4)]	**A**
	Oil-water cooler (3 ... 4kW) [5)]	**W**
Filling		
10	Without return filter	**0**
Function module		
11	Without pump safety block(PSB)	**0**
	With pump safety block [6)]	**1**
Protection		
12	Standard protection	**0**
Other information		
13	None	**-**

1) Size P11 pump can only be selected at 2.2kW, 3kW, or 4kW power.
2) Size P13 pump can only be selected at 2.2kW, 3kW, or 4kW power.
3) Size P16 pumps can only be selected at 4kW power.
4) Depends on ambient temperature, system pressure, and flow rate.
5) Depends on inlet water temperature, system pressure, and flow rate.
6) When selecting the PSB function, it can be used in combination with the IH15 valve block module. For details about the IH15 valve block module, refer to datasheet RE 51156 or consult Bosch Rexroth.

Note:
The default working pressure is preset to 20 bar at the factory. If it needs to be adjusted to other pressures, it must be set on the client side based on the Operating instructions RE 51045-B and Commissioning instructions RE 51045-IB.

List of Recommended Type Code

Type Code	Material Number
innoCube-1X/18/SF2P04/2/B/A/0/1/0	R988163423
innoCube-1X/18/SF2P04/2/P/A/0/1/0	R988163427
innoCube-1X/18/SF2P08/2/B/A/0/1/0	R988163431
innoCube-1X/18/SF2P08/2/P/A/0/1/0	R988163435
innoCube-1X/18/SF3P04/2/B/A/0/1/0	R988163446
innoCube-1X/18/SF4P04/2/B/A/0/1/0	R988163448
innoCube-1X/18/SF4P04/2/B/W/0/1/0	R988163450

Type Code	Material Number
innoCube-1X/18/SF4P04/2/P/A/0/1/0	R988163452
innoCube-1X/18/SF4P04/2/P/W/0/1/0	R988163454
innoCube-1X/18/SF4P08/2/B/A/0/1/0	R988163456
innoCube-1X/18/SF4P08/2/B/W/0/1/0	R988163458
innoCube-1X/18/SF4P08/2/P/A/0/1/0	R988163460
innoCube-1X/18/SF4P08/2/P/W/0/1/0	R988163462
innoCube-1X/18/SF4P13/2/B/A/0/1/0	R988163464

Note:

The recommended type codes listed above do not represent all configurations available from Bosch Rexroth. If your requirements cannot be fulfilled by this list, please refer to the ordering information on page 2 for product selection or contact your sales partner.

Technical data
(For applications outside these values, please consult us!)

General			
Installation orientation			Vertical
Piping connections	▶ Pressure port		G1/2
	▶ Return port		G3/4 (via cooler)
Installation environment			Industrial buildings with low corrosive conditions, air humidity < 80%
Ambient temperature range (during operation)		℃	+5 ... +40 [1]
Material	▶ Oil tank		Carbon steel
	▶ Housing		Carbon steel
	▶ Cooler		Aluminum alloy
Weight (depending on configuration level), without oil		kg	70 ... 80

Hydraulic			
Maximum working pressure		bar	Refer to the characteristic curves starting from pages 6-7
Maximum flow		l/min	Refer to the characteristic curve starting from pages 6-7
Oscilating volume		l	8
Tank capacity		l	18
Hydraulic oil temperature range		℃	+5 ... +65 [1]
Permissible hydraulic fluid			Refer to the table below
Maximum permissible contamination level of hydraulic oil, complying with cleanliness class ISO 4406 (c)			Class 20/18/15[2]
Level monitoring (residual volume)	▶ Warning	l	10
	▶ Shutdown	l	7
Temperature monitoring	▶ Warning	℃	60
	▶ Shutdown	℃	65
Pump	▶ Minimum flow	l/min	0.5 ... 2; Depending on motor and pump size
	▶ Hydraulic fluid viscosity range	mm^2/s	12 ... 800 (permissible range, maximum 2000 at startup) 20 ... 100 (recommended range)

Hydraulic fluid	Classification	Suitable sealing materials	Standard	Datasheet
Mineral oils	HLP ISO VG 32 HLP ISO VG 46 HLP ISO VG 68	NBR, FKM	DIN 51524	90220

1) The choice of hydraulic oil is determined by the ambient temperature and the hydraulic oil temperature during operation. If the operating temperature is below 10° C, it is recommended to use a hydraulic oil with lower viscosity (such as VG32, VG46).

2) The cleanliness class specified for components must be adhered to in the hydraulic system. Effective filtration prevents malfunctions and extends the service life of components. innoCube products do not come with built-in filters; customers must equip them externally with high-pressure or return line filters.

Important notes on hydraulic oil:

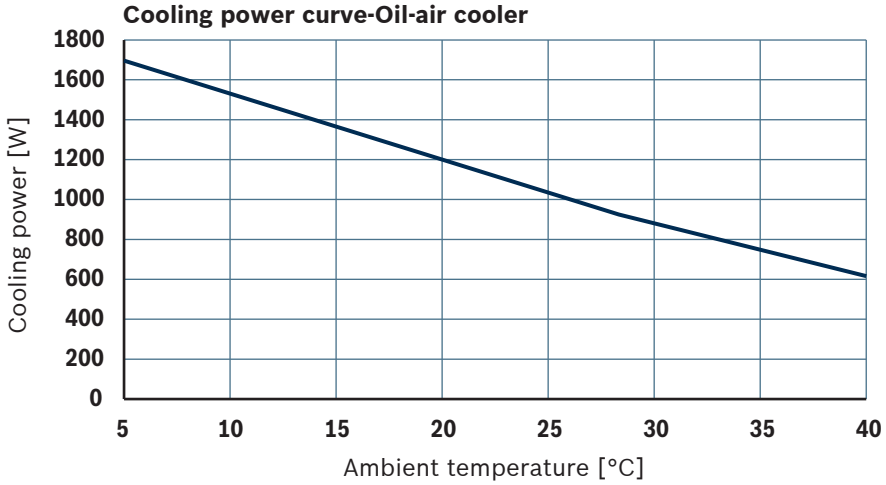
- For detailed information and instructions on using other hydraulic oils, refer to the datasheets above or contact us.

Technical data
(For applications outside these values, please consult us!)

Electrical			
	▶ Power class	kW	1.5; 2.2; 3.0; 4.0
	▶ Voltage (according to IEC 60038)	V	380 ... 480 AC (-15% / +10%)
	▶ Frequency	Hz	50/60
Protection class, according to DIN EN 60529			IP 20
Maximum pre-fusing of motor protection switch (customer side)	▶ Power 1.5 kW	Maximum A	10
	▶ Power 2.2 kW	Maximum A	16
	▶ Power 3.0 kW	Maximum A	20
	▶ Power 4.0 kW	Maximum A	20

Oil-water cooler			
Cooling power		kW	3 ... 4
Cooling water supply requirements	▶ Flow	l/min	> 8
	▶ Inlet temperature	℃	15 ... 30
	▶ Connections		G1/2 (2x, cylindrical)
	▶ Maximum glycol proportion	%	30
	▶ Maximum cooling water pressure	bar	10

Oil-air cooler		
Cooling power	kW	0.6 ... 1.7 (refer to the curve below)
Ambient temperature range (during operation)	℃	+5 ... +40

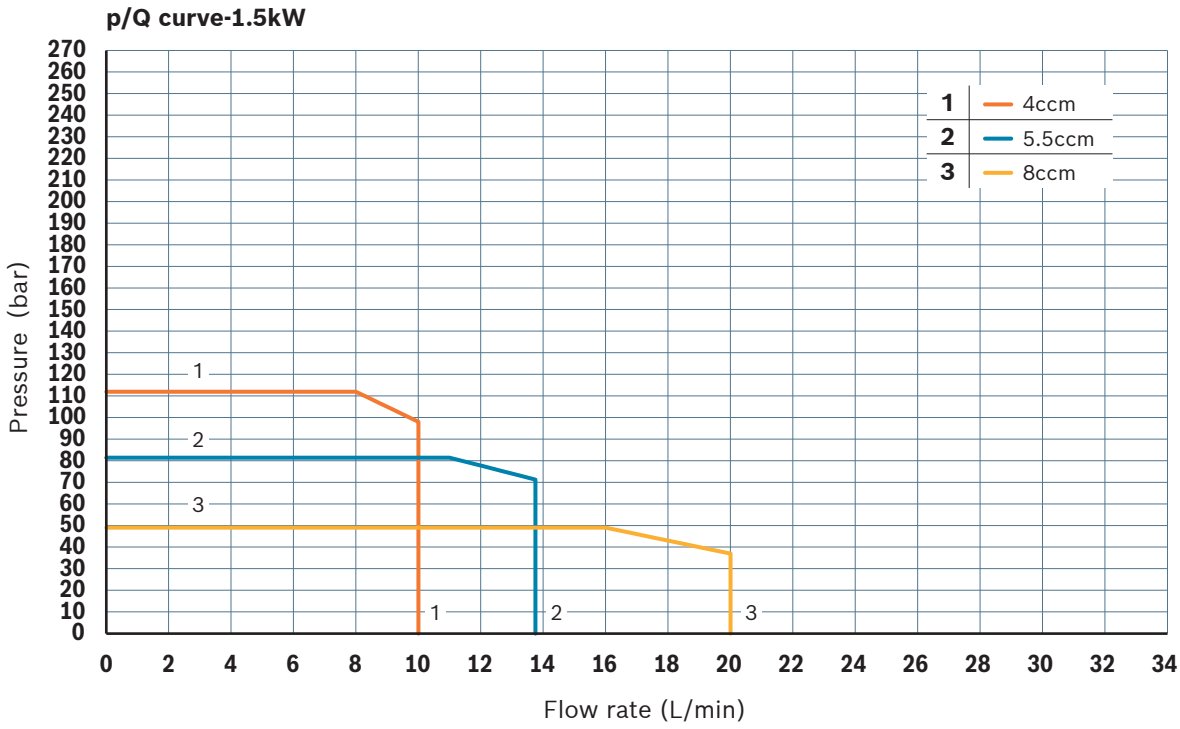


Notice:
For both air-cooled and water-cooled versions, the ambient temperature must always be kept below 40° C during operation, and good ventilation conditions must be ensured to cool the motor and frequency converter.
For the water-cooled version, ensure that the cooling water temperature is always not lower than the dew point of the surrounding air of the power unit.

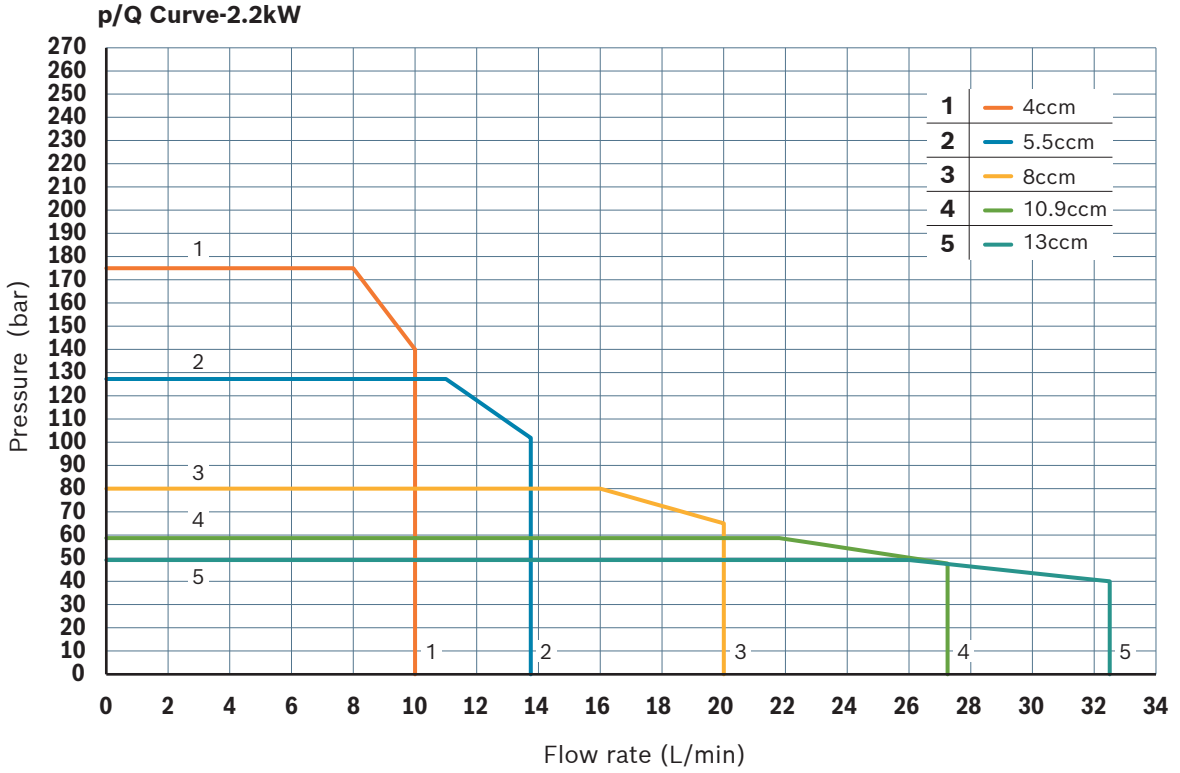
Characteristic curves

(Measured with HLP46, ϑ_{oil} = 40 ±5 ° C; voltage 380V - 480V)

Pressure-flow curve for project planning - 1.5kW



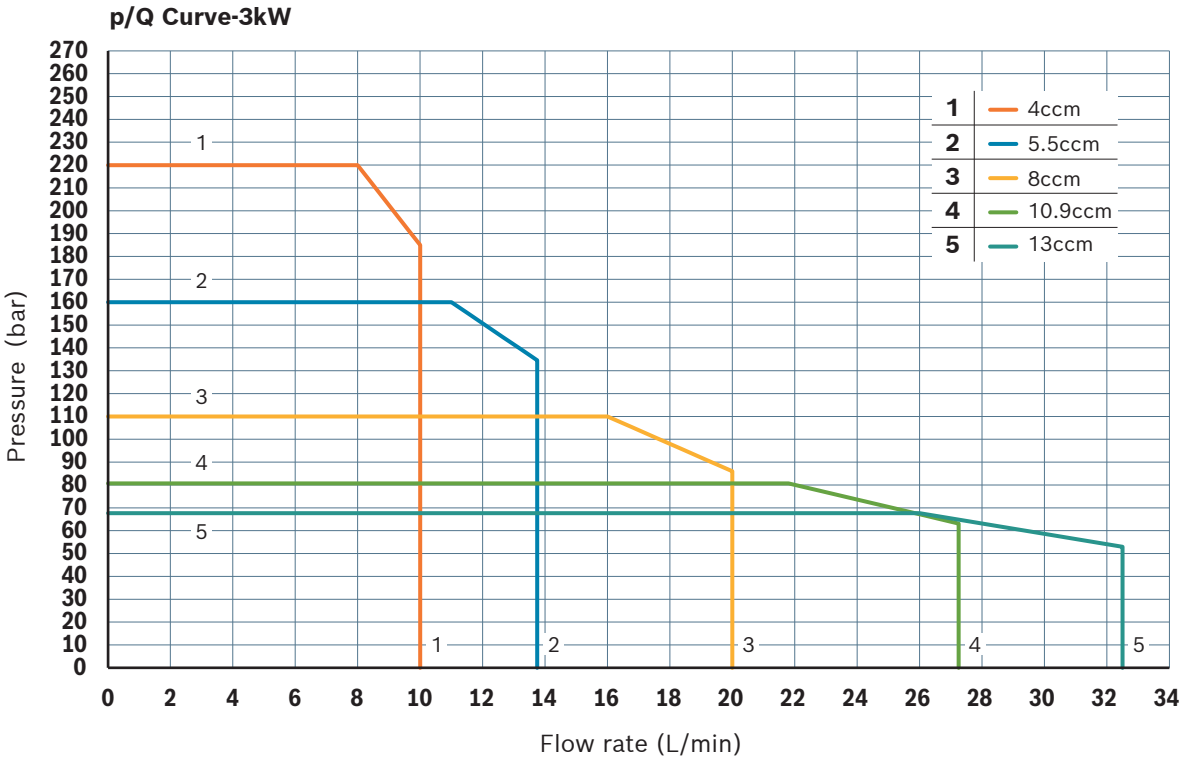
Pressure-flow curve for project planning - 2.2kW



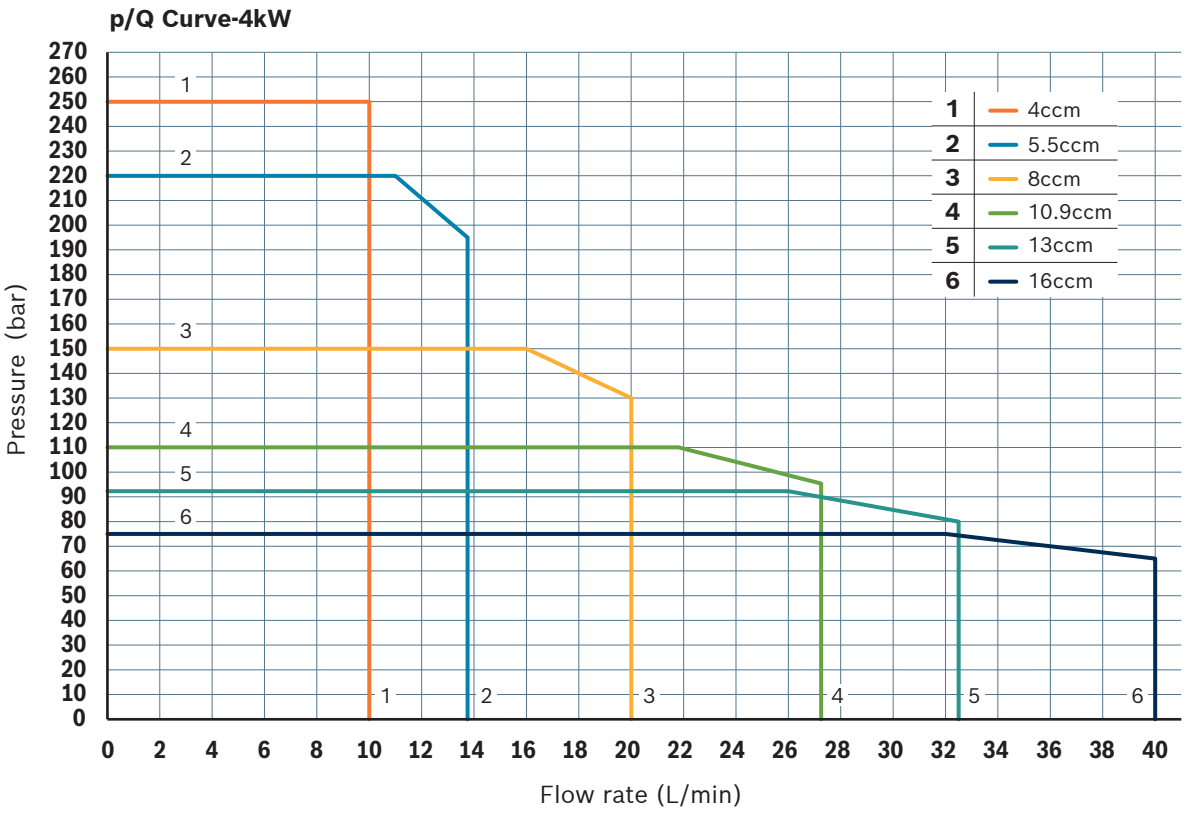
Characteristic curves

(Measured with HLP46, ϑ_{oil} = 40 ±5 ° C; voltage 380V - 480V)

Pressure-flow curve for project planning - 3kW



Pressure-flow curve for project planning - 4kW

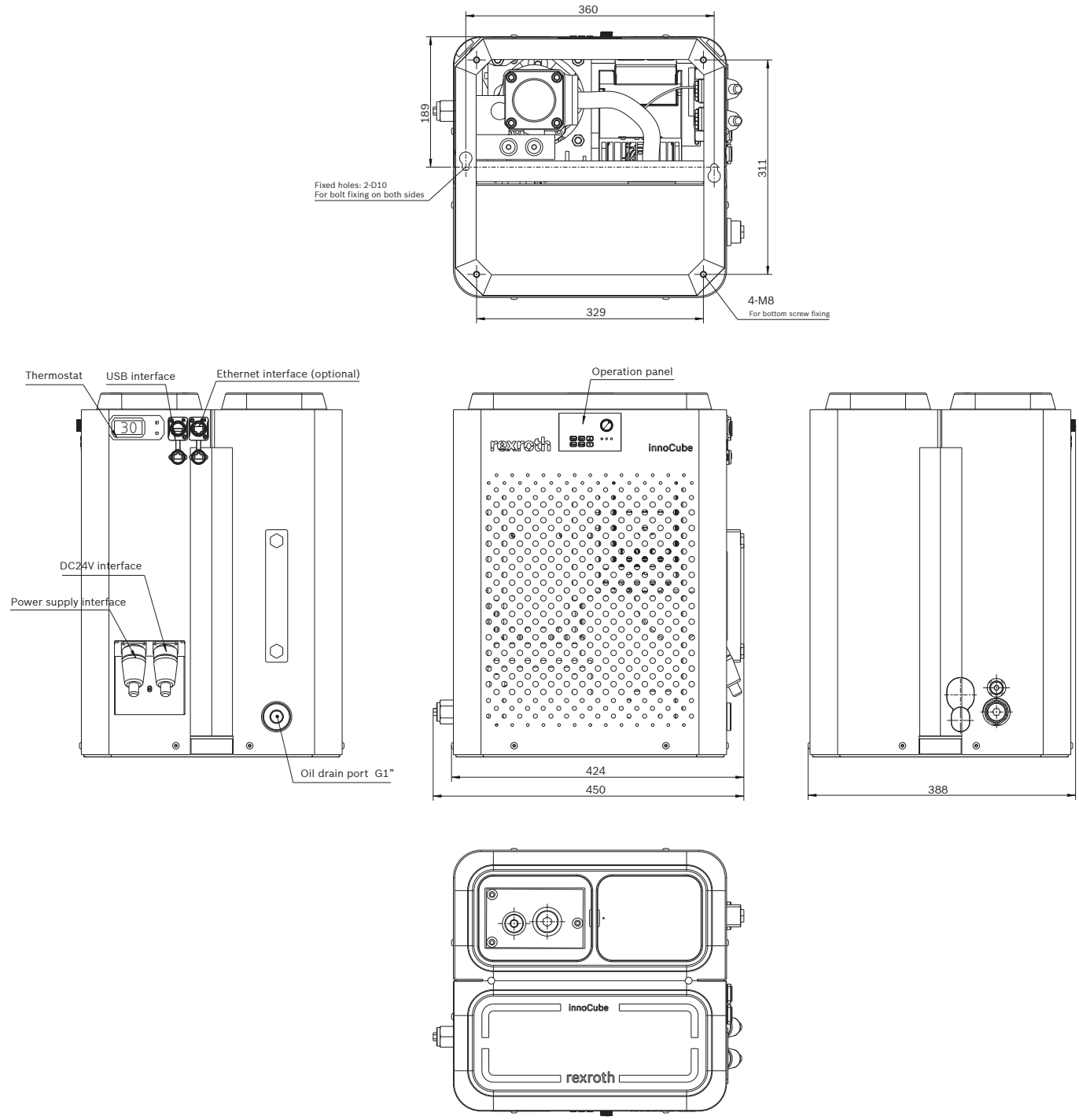


Important notes on the pressure-flow curve:

The inclined segment of each curve represents the constant power region. The duty cycle of the product operating in this region must not exceed 30%, otherwise the motor or frequency converter may trigger an overtemperature alarm.

Dimensions
(Dimension description, unit: mm)

Outline and installation dimensions

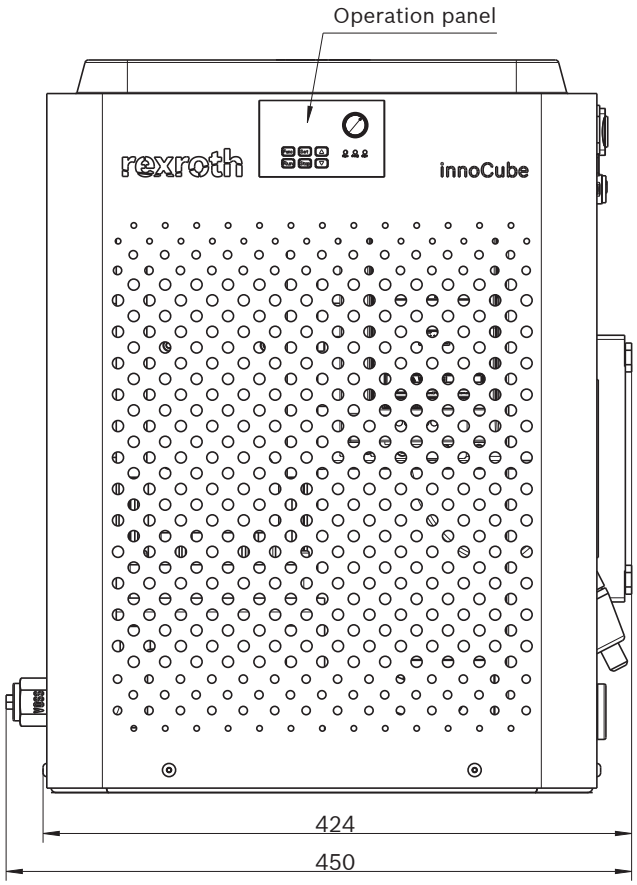


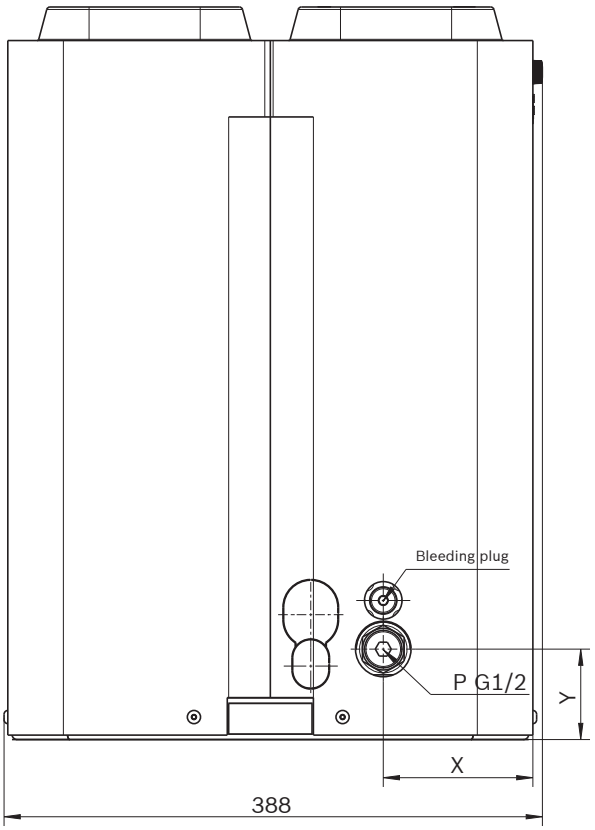
Note:

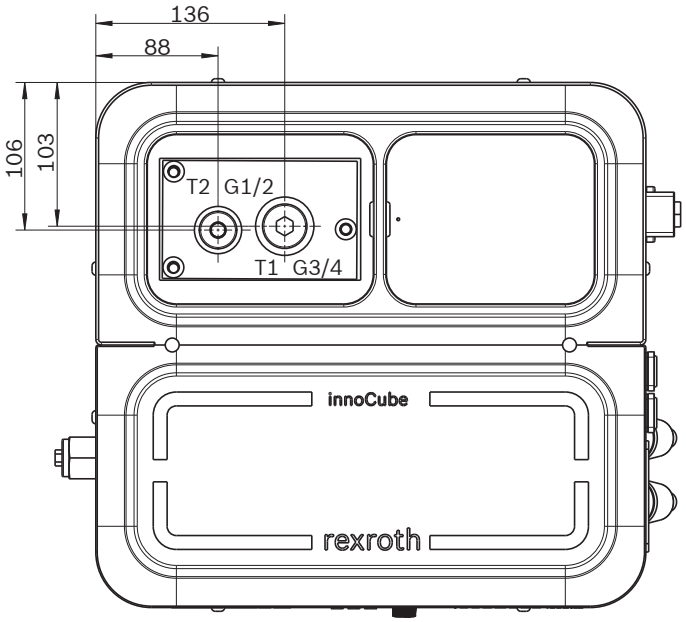
The power unit must be placed on a flat surface, preferably on damping pads. Regardless of whether the water-cooled or air-cooled version is selected, to ensure cooling of the motor and frequency converter, it must be installed in a well-ventilated location.

Dimensions
(Dimension description, unit: mm)

Port dimensions-version without PSB





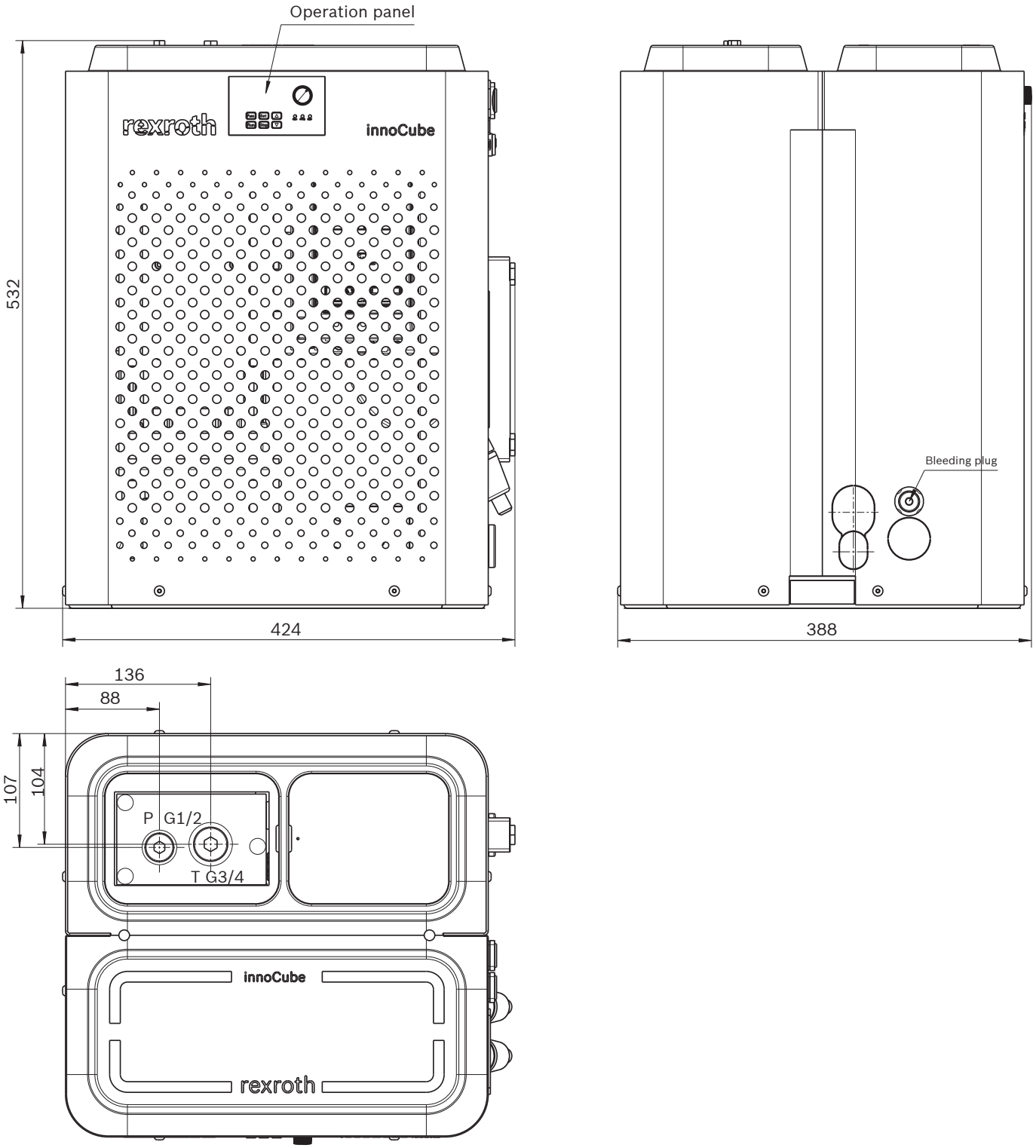


X (port P)	Y (port P)	Pump size
108	65	P04
108	62	P05
160	96	P08
160	93	P11
160	90	P13
160	87	P16

Dimension of pressure port (P) position for configuration without PSB

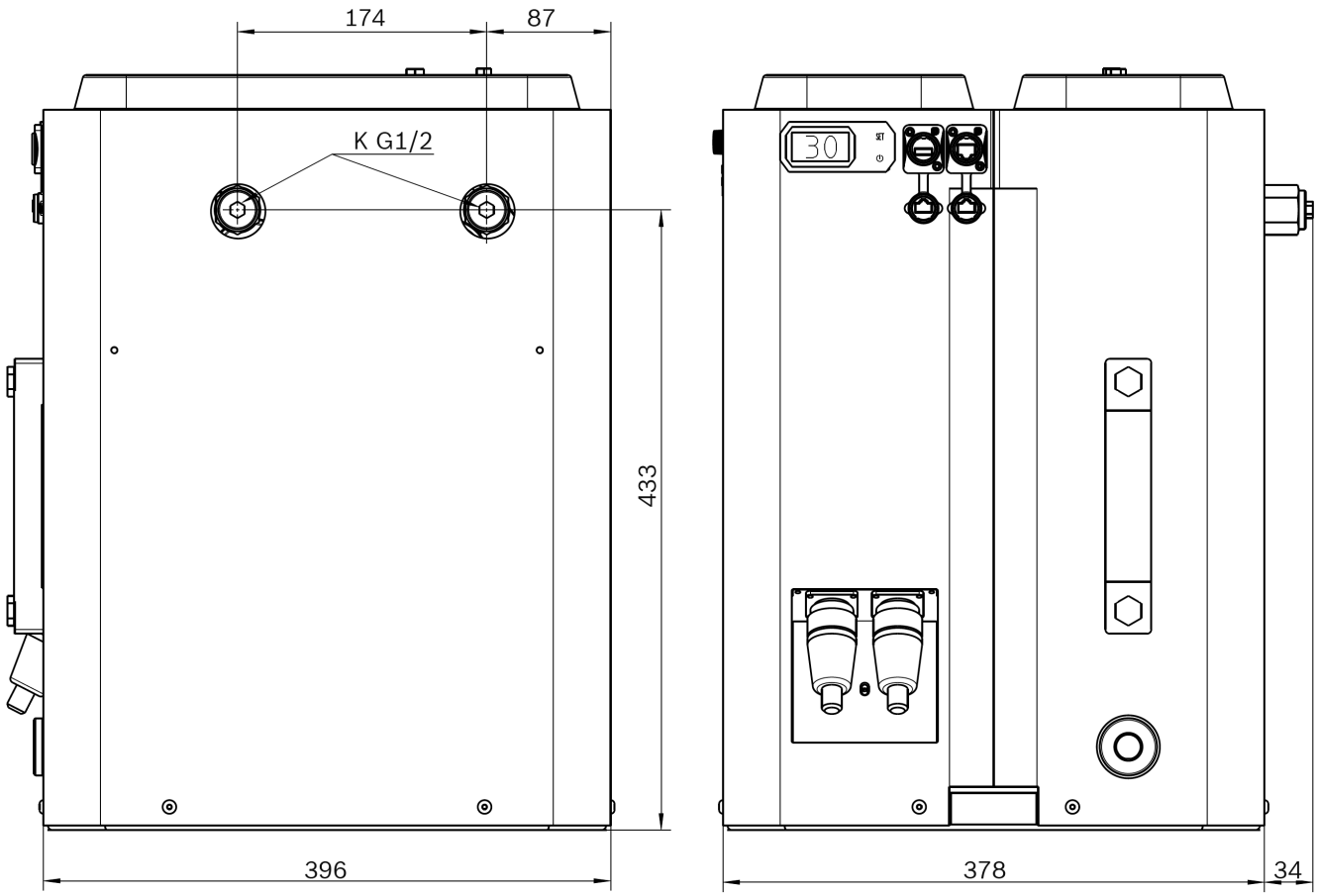
Dimensions
(Dimension description, unit: mm)

Port dimensions-version with PSB



Dimensions
(Dimension description, unit: mm)

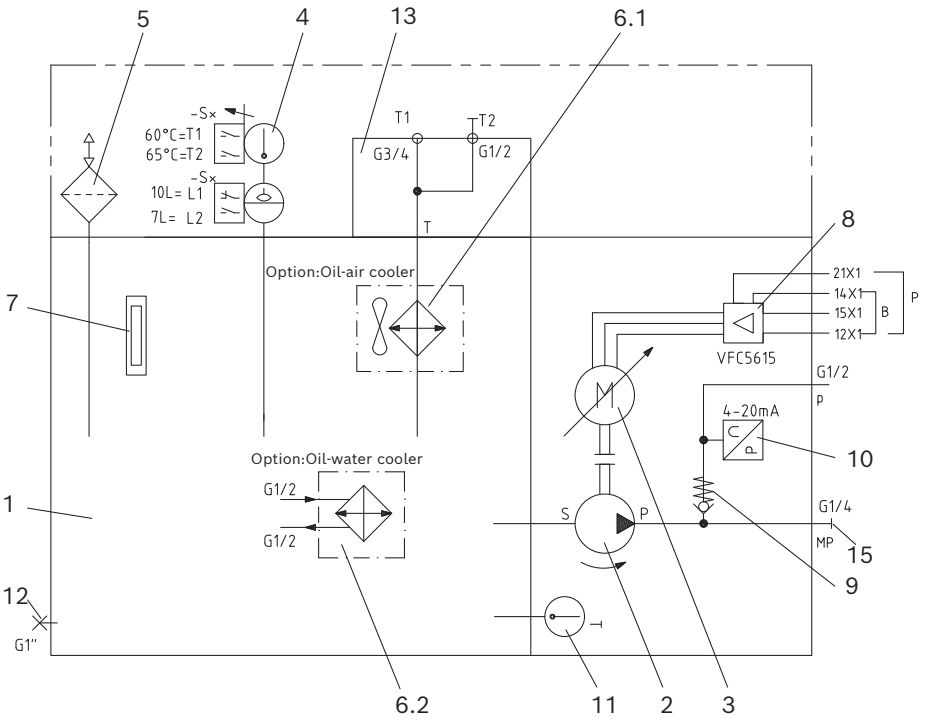
Size of water connections-Oil-water cooling version



* Note: The cooling water interface does not differentiate between the inlet and the outlet.

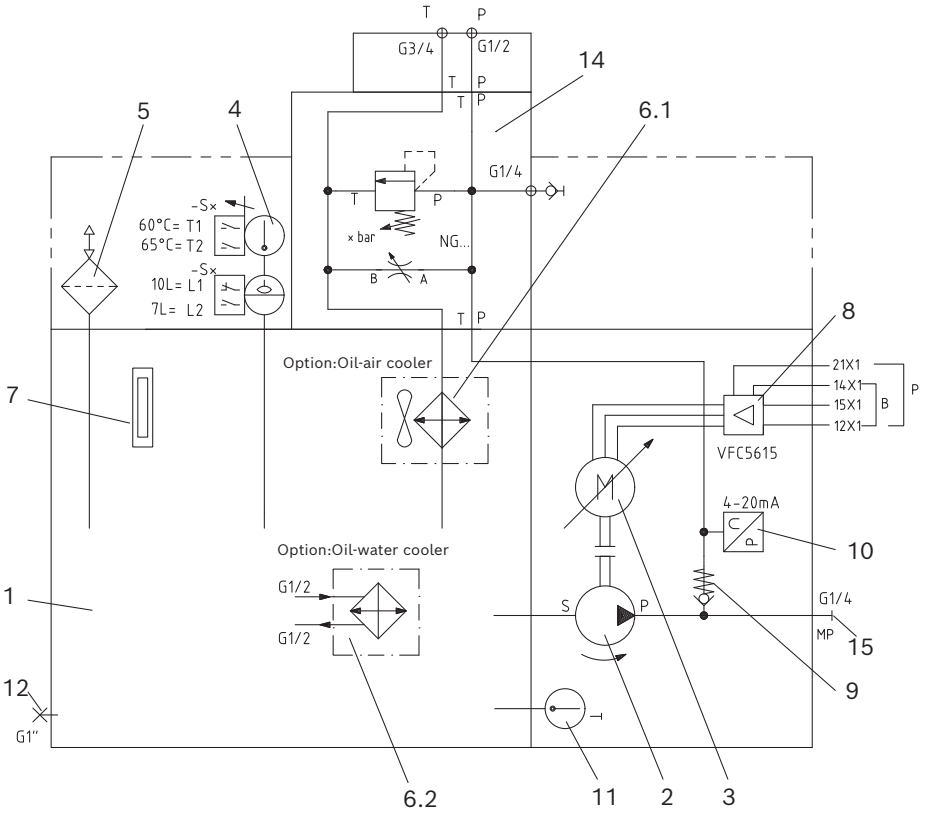
Circuit diagram, hydraulic

Circuit diagram: hydraulic without Pump Safety Block (PSB)



innoCube-1X/18/SF../2/././0/0/0 schematic (without PSB)

Circuit diagram: hydraulic with Pump Safety Block (PSB)



innoCube-1X/18/SF../2/././0/1/0 schematic (with PSB)

Electrical connections (as shown in the figure below)

1	Oil tank
2	Pump
3	Motor
4	Level/temperature sensor
5	Air filter
6	Cooling unit
6.1	Oil-air cooler (position 09 select A)
6.2	Oil-water cooler (position 09 select W)
7	Oil gague
8	Frequency converter
9	Check valve
10	Pressure sensor
11	Temperature controller
12	Oil drain plug
13	Return oil block (Position 11 option 0, without PSB)
14	Pressure module (Position 11 option 1, with PSB)
15	Bleeding plug

B	Data interface type: "Basic Type B"
16	12X1: Power supply interface
17	15X1: DC24V interface
18	14X1: USB service interface
P	Data interface type: "Advanced Type P" additional
19	21X1: Multi-Ethernet interface RJ45, network input

Pre-start control (Pressure drop /Overpressure compensation)

Utilizing the control signal, the drive unit accelerates before the hydraulic actuator is engaged. This reduces pressure drop and may eliminate the need for a hydraulic accumulator.

Note:

For more information refer to operating instructions VFC R912009378.

Sleep function

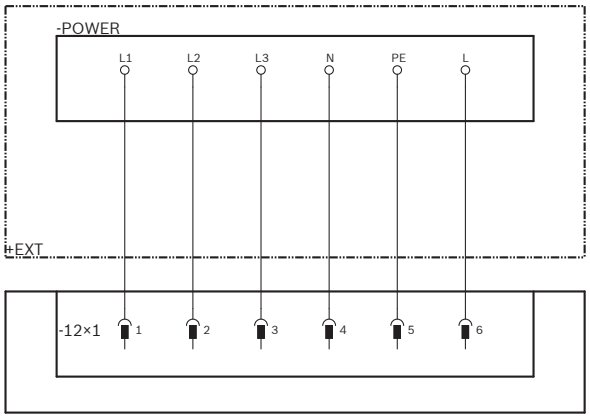
With integrated pressure monitoring, the hydraulic power unit automatically shuts off when the set pressure is reached and the current flow is below the threshold, restarting when the pressure drops. This enhances energy efficiency and enables accumulator charging circuits without additional control signals (see RE 51045-IB innoCube commissioning manual).

Sensor and interface selection

		B	P
Sensor technology	Level sensor early warning (10 liters)	✓	✓
	Level sensor shutdown (7 liters)	✓	✓
	Oil temperature sensor early warning (60° C)	✓	✓
	Oil temperature sensor shutdown (65° C)	✓	✓
	Drive unit overtemperature shutdown	✓	✓
	Motor overtemperature protection	✓	✓
Analysis	Sensor wiring and evaluation are integrated in the power unit.	✓	✓
	Read all power unit parameters for condition monitoring.	–	✓
Interface	Power unit enable input (24 V)	✓	–
	Power unit fault reset input (24 V)	✓	–
	USB service interface	✓	✓
	Output - Power unit operation ready (0 V); Fault 24 V	✓	✓
	Multi-Ethernet interface	–	✓
	Pre-start control	–	✓
Function	Visualize fault conditions via LED light strip.	✓	✓
	Access and adjust all power unit parameters (e.g., pressure level, flow rate).	–	✓
	Sleep function (Accumulator charging circuit).	✓	✓
	Temperature controller manages cooling fan.	✓	✓
	Control panel modifies drive control parameters.	✓	✓

Electrical connections

12X1: Power supply interface

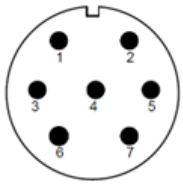


Voltage	3P 380 V ...480 VAC (-15% / +10%)
Frequency	50/60Hz
Assignment	L1/L2/L3/N/PE/L
Rotating field	Clockwise
Pre-fuse on the customer side	Power 1.5 kW → Max. 10 A Power 2.2 kW → Max. 16 A Power 3.0 kW → Max. 20 A Power 4.0 kW → Max. 20 A
Fuse (220VAC) customer	Max. 1A

The customer must provide an independent power supply, including backup fuses and power contactors. L1/L2/L3 are for innoCube drive power, and L/N for innoCube cooling unit. For systems with a neutral line: connect L to any phase (L1/L2/L3). For 3-phase systems without a neutral: connect L/N to 220V single-phase. PE is ground.

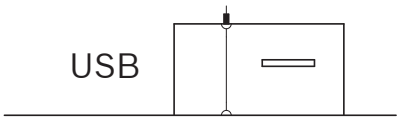
12X1 plug

(product includes plug for customer cable installation; pre-wired plug available separately - see accessories chapter).



Pin	Function
1	L1
2	L2
3	L3
4	N
5	PE
6	L

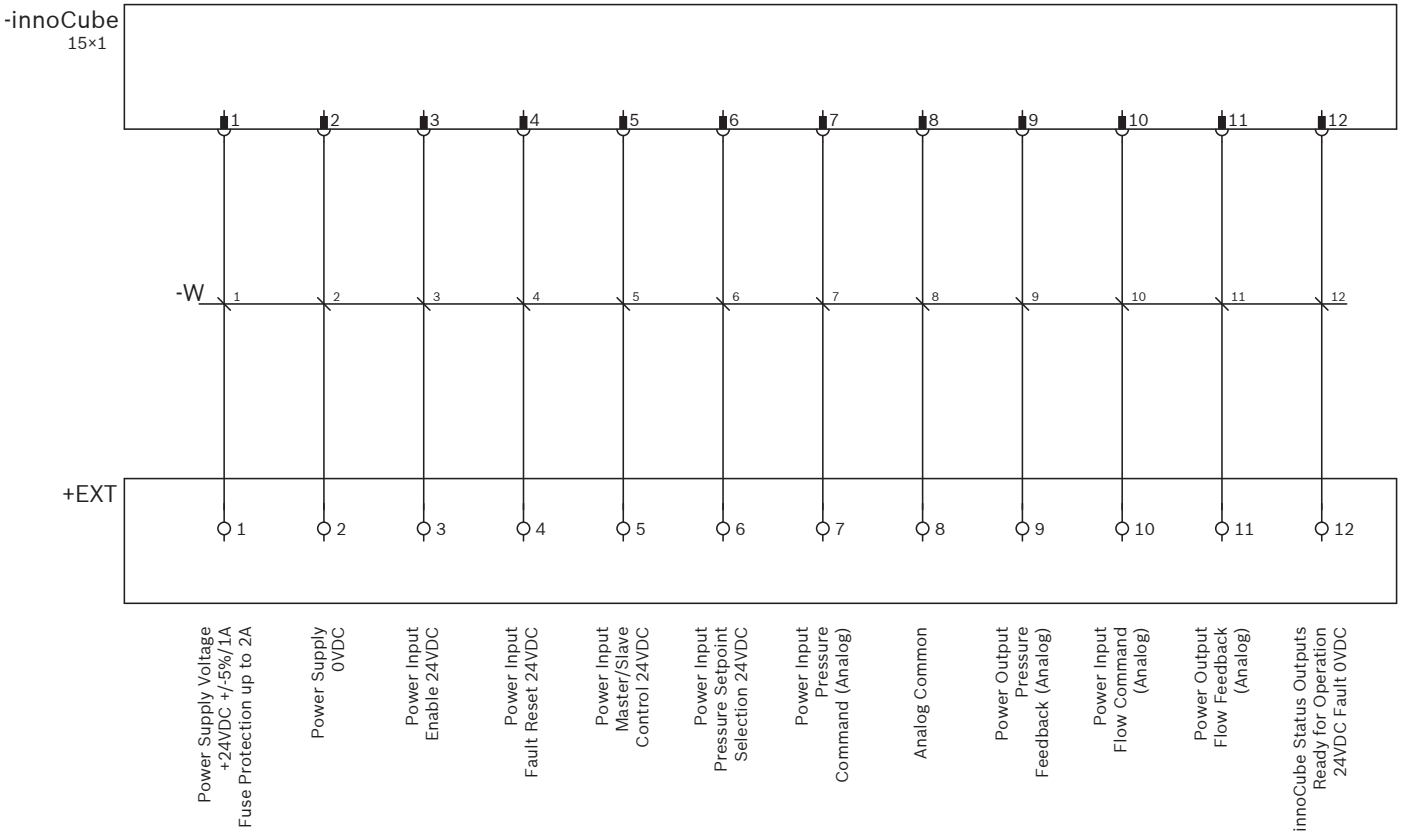
14X1: USB to frequency converter



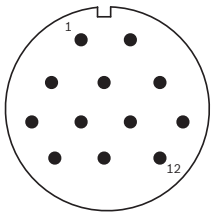
Inverter interface (USB).

Electrical connections

15X1: DC24V interface



Note:
If not operation-ready → indicates a fault



Device plug; 12-pin

Pin	Function	Basic type	Advanced type
1	Power supply voltage 24 VDC	✓	✓
2	Power supply voltage 0V	✓	✓
3	Enable	✓	*
4	Fault acknowledgment	✓	*
5	Master/Slave	✓	*
6	Pressure command switching when fixed value is set	✓	*
7	Pressure command	✓	*
8	Analog common terminal	✓	*
9	Pressure feedback	✓	*
10	Flow command	✓	*
11	Flow feedback	✓	*
12	InnoCube ready	✓	*

* These functions can be implemented via fieldbus.

Pin 5 Bit0		Parameter	Description
0	Parameter setting 1	F2.22	This unit as master
1	Parameter setting 2	F2.22	This unit as slave

Pin 6		Parameter	Name
0	Parameter setting 1	F1.05	Pressure command digital setting 0
1	Parameter setting 2	F1.06	Pressure command digital setting 1

Note:
In both Basic and Advanced configuration levels, sensors are factory-connected to the integrated control system and evaluated.
Sensor status is signaled via integrated LED strips and can be read through the USB service interface.
Modifying operating pressure and flow:
In Basic configuration, pressure/flow commands can be set as fixed values or adjusted via analog signals. In Advanced configuration, they can be set as fixed values or modified via analog signals or communication.

Electrical connections

21X1: Ethernet interface

	Device socket IP65, push-pull type

Note:
Only use suitable plugs and cables with IP65 protection rating. Refer to Accessories chapter on page 18 for purchasing information.

Accessories (separate order)

Electrical accessories

12X1	Power plug	
R988150939	2M POWER CABLE WITH CONNECTOR	Straight power plug with cable, open end; Length: 2 m
R988150940	5M POWER CABLE WITH CONNECTOR	Straight power plug with cable, open end; Length: 5 m
R988150941	10M POWER CABLE WITH CONNECTOR	Straight power plug with cable, open end; Length: 10 m

14X1	USB service interface	
R988150948	3M USB INDUSTRIAL DATA CABLE A MALE TO &	USB cable with ferrite core, A/A; Length: 3 m
R988150949	5M USB INDUSTRIAL DATA CABLE A MALE TO &	USB cable with ferrite core, A/A; Length: 5 m

15X1	DC24V interface	
R988158635	CONTROL PLUG WITH CABLE 2M	Straight shielded socket, 12-pin, open end; Length: 2 m (12x0.34 mm² / d=9.0 mm); 24 VDC, max. 2A, IP54
R988158634	CONTROL PLUG WITH CABLE 5M	Straight shielded socket, 12-pin, open end; Length: 5 m (12x0.34 mm² / d=9.0 mm); 24 VDC, max. 2A, IP54
R988158636	CONTROL PLUG WITH CABLE 10M	Straight shielded socket, 12-pin, open end; Length: 10 m (12x0.34 mm² / d=9.0 mm); 24 VDC, max. 2A, IP54

21X1	Multi-Ethernet interface[1)]	
R988160037	CONNECTOR PLUG BL-HK045C	Plug, without cable
R988150936	2M INDUSTRIAL ETHERNET CABLE	Network cable, without plug, length: 2 m; certification: CAT 6A / RoHS
R988150937	5M INDUSTRIAL ETHERNET CABLE	Network cable, without plug, length: 5 m; certification: CAT 6A / RoHS
R988150938	10M INDUSTRIAL ETHERNET CABLE	Network cable, without plug, length: 10 m; certification: CAT 6A / RoHS

Mechanical accessories

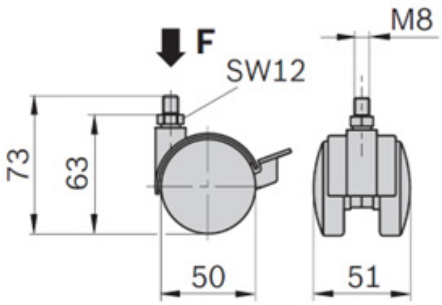
	Air filter	
R928018808	TANK AERATION FLTR FEF 0 P10-F00	Air Filter

	Caster	
3842535669	IDLE ROLLER D50-M8	Caster

Caster installation

Material Number	Name
3842535669	Caster D50-M8

D50-M8



Project planning information

- For models without PSB function, ensure that a pressure relief valve is installed in the pressure line before commissioning by customer. For models equipped with PSB function, a pressure relief valve is already installed internally. These pressure relief valves should be set at the customer’ s site (set pressure 10% higher than the nominal pressure, but not exceeding 270 bar).
- The power supply and 24 V power must be protected on the client side as described on page 15.
- The power unit requires ventilation for cooling the motor and frequency converter.
- The connection between the power unit and the machine must be made using hydraulic hoses (rigid pipes are not permitted).
- The client must ensure that the initial temperature of the cooling water is not lower than the dew point of the surrounding air of the power unit.
- The maximum working pressure specified in the characteristic curves on pages 6-7 must not be exceeded.

Further information

Hydraulic oil based on mineral oil	Datasheet 90220
Information on available spare parts	www.boschrexroth.com/spc
innoCube operating manual	RE 51045-B
innoCube commissioning instructions	RE 51045-IB
VFC operating instructions	R912009378
FcP 5020 operating manual	R912008034

Notes

Bosch Rexroth AG
Industrial Hydraulics
Zum Eisengießer 1
97816 Lohr am Main, Germany
Phone +49 (0) 93 52 / 40 30 20
my.support@boschrexroth.com
www.boschrexroth.com

Bosch Rexroth AG, RE 51045, Edition: 2025-08