HYDAC INTERNATIONAL

HYDAC EcoPack

Power packs with variable speed drive

The modular solution that electrifies your mobile machine

As part of the efforts to reduce CO2 emissions, electric drives are increasingly being used instead of combustion engines.

Electro-hydraulic supply units with high power density are the ideal alternative when it comes to converting the system architecture from combustion engines to electric drives.

Our product portfolio of modular power packs with variable speed drives includes the right solution for all your machine requirements.

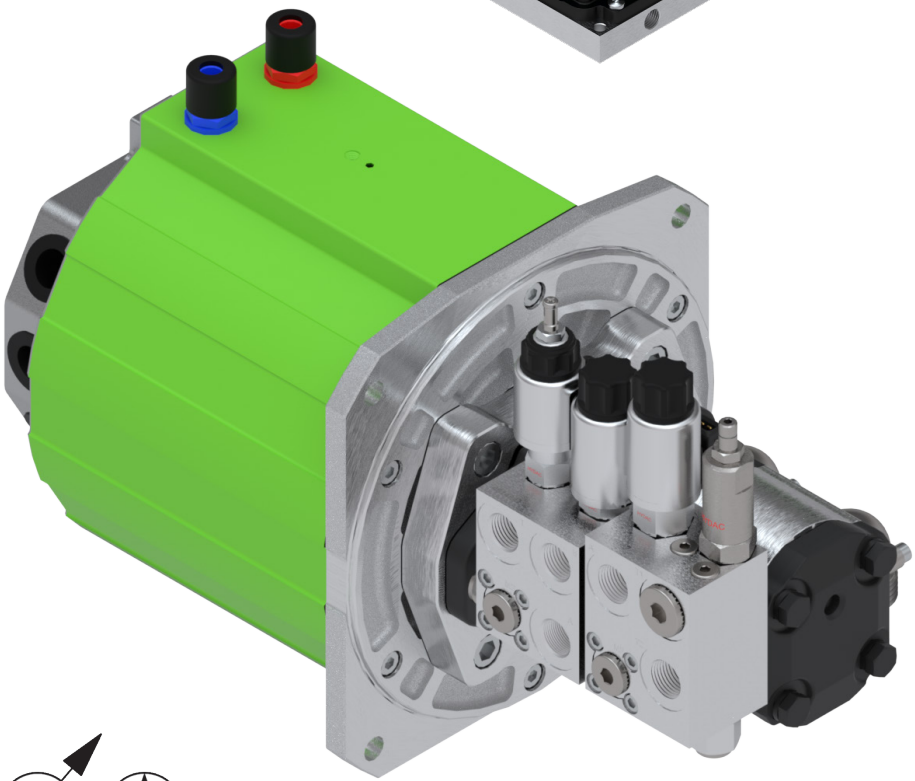
Product advantages

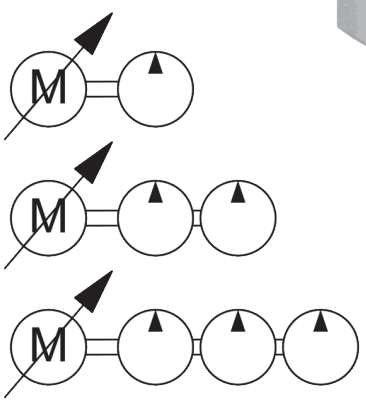
- Efficient synchronous motor technology for the higher power range
- Noise-optimised pump (single/ double/triple pump concept)
- Product range scaled in size, with modular design using standardised interfaces
- Plug & play solution (pre-configured inverter, motor, pump, wiring, hydraulic control from a single source and ready for connection)
- Optional extension with a hydraulic control unit by means of control blocks connected directly to the pump or through distributed control blocks

Technical data

- Voltage: 48 - 420 VDC
- Rated power: up to 31 kW
- p_{max}: 320 bar
- In acc. with IEC 60034-1, suitable for: Operating mode S1 or S2 = 60 min.*

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





EN 5.328.0/06.24

1. Product description, key facts

The new HYDAC EcoPack is a power pack product portfolio with variable speed drive that delivers a decentralised stand-alone solution for providing your hydraulic actuators with the power they need.

Up to three rigidly connected gear pumps with a rotational speed ranging from a minimum of 600 to a maximum of 4,200 rpm can be motorised. Internal gear pumps further extend the rotational speed range and the possible operating pressures. This way, each pump can fulfil an individual function within the machine.

Depending on the application scenario, the pump capacities can be merged by connecting a corresponding hydraulic control block downstream of the gear pump. Depending on the operating mode, the function and the supply voltage on the machine, we optionally supply the EcoPack with an air- or a water-cooled motor or inverter in a standard voltage range of 48 – 420 VDC. (up to 800 VDC upon request)

An inverter converts the battery's DC voltage into a three-phase AC voltage that supplies the motor. The variable rotational speed of the motor is determined by the communication between a speed sensor and the inverter, which in turn receives the set values from a higher-level machine control system.

The inverter required for the respective motor is configured with standard parameters, but can also be configured individually as required. Furthermore, it is possible to integrate the inverter into the machine architecture via CAN bus (CANopen or SAEJ1939* protocol). When combined with HYDAC control units (TTC), the EcoPack can be integrated as an independent subsystem in the machine architecture.

* J1939 is not currently implemented on our hardware, but it will be integrated into MATCH in the future.

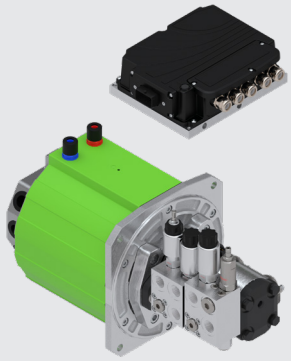
2. Power classes and voltages

Electrical supply

- 48 – 96 V DC
- up to 14 kW

- 420 V DC
- up to 31 kW

Additional voltages and power classes upon request



Hydraulic power

- up to 320 bar
- up to 100 l/min

Other pressures and flow rates upon request

3. General technical data

Safety information:

- To protect life and limb, ensure compliance with the safety information. Before start-up, the safety instructions must be read and followed without fail – see chapter 17. "Safety information and documentation". Failure to observe these instructions will invalidate the product warranty!

Other parameters:

Operating mode in acc. with IEC 60034-1:	S1 (water cooled) S2 = 60 min. (air cooled)
Protection class:	IP65 in acc. with DIN EN 60529 or IP6K9K in acc. with ISO 20653
Pressure fluid:	Mineral oil in acc. with DIN 51524 Part 1 and 2 *
Temperature range of pressure fluid:	Min. -20 °C to max. +80 °C *
Viscosity range:	Min. 12 mm²/s to max. 380 mm²/s, max. 2,000 mm²/s temporarily during cold start
Cleanliness class in acc. with ISO 4406:	19/17/11 or cleaner
Ambient temperature:	-20 °C to +40 °C *

* other technical data upon request

4. Combinations possible

Inverter			Pump	Motor		
Cooling inverter	Unom [VDC]	Inverter-code	Pump Vg * [ccm]	Motor power [kW]	Motor code	Motor cooling
Air cooled inverter	48	Z48/4	6; 8; 10; 13; 16	9	159AH-06012-SHE	Air cooled motor
				14	205A-08011-JHE	
			19; 25	14	205A-08011-HGE	
	96	Z96/4	6; 8; 10; 13; 16	13	159AH-06012-SHE	
				22	205A-08011-JHE	
			19; 25	22	205A-08011-HGE	
			6; 8; 10; 13; 16	15	159WH-07026-SHE	Water cooled motor
			19; 25	15	159WH-07026-CGE	
Water cooled inverter	350 (max. 420)	Z350	6; 8; 10; 13; 16	15	205W-04099-SHR	
				31	205W-08052-SHR	
			19; 25	31	205W-08052-CGR	

* For double pumps, VG1 (pump 1) ≥ VG2 (pump 2) must be selected. * For triple pumps, VG1 (pump 1) ≥ VG2 (pump 2) ≥ VG3 (pump 3) must be selected.

5. Model code

For example: **HEP** – **Z350** – **PGS19/10/10R** – **S** – **205W-08052-CGR**

(Inverters: HEP – Z350 | Pump: PGS19/10/10R | Motor: S – 205W-08052-CGR)

Basic type

HEP = HYDAC EcoPack

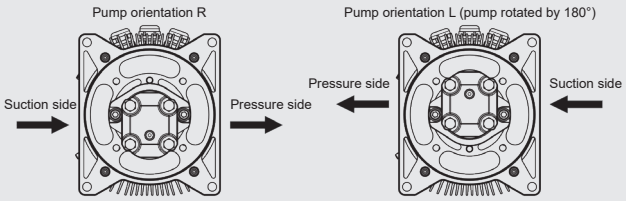
Inverter code

Z48/4 = 48 VDC inverter, air cooled
Z96/4 = 96 VDC inverter, air cooled
Z350 = 350 VDC inverter, water cooled
(other inverter upon request)

Pump design + number and size of pump stages + orientation

PGS = Silent external gear pump (Pump Gear Silent)
PGSS = Super silent external gear pump (Pump Gear Super Silent)
PGI = Internal gear pump (Pump Gear Internal)
Vg1 = Single pump, Vg1 specification in ccm
Vg1/Vg2 = Double pump, Vg1+Vg2 specification in ccm
Vg1/Vg2/Vg3 = Triple pump, Vg1+Vg2+Vg3 specification in ccm

R = Pressure port on right, facing pump (standard)
L = Pressure port on left, facing pump



Motor design

S = Permanent magnet synchronous motor
A = Asynchronous motor (upon request)

Motor code

159AH-06012-SHE = size 159, air-cooled, 9/13 KW, SHE interface
205A-08011-JHE = size 205, air-cooled, 14/22 kW, JHE interface
205A-08011-HGE = size 205, air-cooled, 14/22 kW, HGE interface
159WH-07026-SHE = size 159, water-cooled, 15 kW, SHE interface
159WH-07026-CGE = size 159, water-cooled, 15 kW, CGE interface
205W-04099-SHR = size 205, water-cooled, 15 kW, SHR interface
205W-08052-SHR = size 205, water-cooled, 31 kW, SHR interface
205W-08052-CGR = size 205, water-cooled, 31 kW, CGR interface

6. Air-cooled motor-pump combinations

Motor	Pump			Flow rate* [l/min]			Pressure* [bar]		Rotational speed [rpm]			Weight [kg]
	Type	Vg [ccm]		min	nom	max	nom	max	min	nom	max	approx.
159AH-06012-SHE	PGS	6	6.2	2.8	22	22	200	250	500	4,000	4,000	19
	PGSS		6.5	2.9	23	23	185	280	500	4,000	4,000	20
	PGI		6.4	1.2	23	24	190	320	200	4,000	4,200	19
	PGS	8	8.3	3.7	30	30	145	250	500	4,000	4,000	19
	PGSS		8	3.6	29	29	150	280	500	4,000	4,000	20
	PGI		7.8	1.4	28	30	150	320	200	4,000	4,200	19
	PGS	10	11.3	5.1	37	37	105	250	500	3,600	3,600	19
	PGSS		10.1	4.5	36	36	120	280	500	4,000	4,000	20
	PGI		10.8	2.0	39	39	110	320	200	4,000	4,000	20
	PGS	13	14.5	6.5	43	43	85	250	500	3,300	3,300	19
	PGSS		12.6	5.7	45	45	95	270	500	4,000	4,000	20
	PGI		13.3	2.4	48	48	90	305	200	4,000	4,000	20
	PGS	16	16.5	7.4	45	45	70	245	500	3,000	3,000	19
	PGSS		15.9	7.2	57	57	75	255	500	4,000	4,000	20
	PGI		15.6	2.8	57	57	75	255	200	4,000	4,000	20
205A-08011-JHE	PGS	6	6.2	2.8	12	22	230	250	500	2,070	4,000	35
	PGSS		6.5	2.9	12	23	275	280	500	2,070	4,000	36
	PGI		6.4	1.2	12	24	250	320	200	2,070	4,200	36
	PGS	8	8.3	3.7	15	30	230	250	500	2,070	4,000	35
	PGSS		8	3.6	15	29	275	280	500	2,070	4,000	36
	PGI		7.8	1.4	15	30	250	320	200	2,070	4,200	36
	PGS	10	11.3	5.1	21	37	205	250	500	2,070	3,600	35
	PGSS		10.1	4.5	19	36	230	280	500	2,070	4,000	36
	PGI		10.8	2.0	20	39	210	320	200	2,070	4,000	36
	PGS	13	14.5	6.5	27	43	160	250	500	2,070	3,300	35
	PGSS		12.6	5.7	23	45	185	270	500	2,070	4,000	37
	PGI		13.3	2.4	25	48	175	320	200	2,070	4,000	36
	PGS	16	16.5	7.4	31	45	140	250	500	2,070	3,000	36
	PGSS		15.9	7.2	30	57	140	295	500	2,070	4,000	37
	PGI		15.6	2.8	29	57	140	295	200	2,070	4,000	36
205A-08011-HGE	PGS	19	19.6	8.8	37	53	120	270	500	2,070	3,000	38
	PGSS		20	9.0	37	63	115	250	500	2,070	3,500	38
	PGI		19.3	1.7	36	63	120	300	100	2,070	3,600	37
	PGS	25	23.7	10.7	44	60	98	250	500	2,070	2,800	38
	PGSS		25.2	11.3	47	68	90	210	500	2,070	3,000	38
	PGI		25.2	2.3	47	82	90	280	100	2,070	3,600	38

* Pressures and flow rates, achievable under optimum conditions, may vary depending on the electrical power supply, oil viscosity, ambient conditions and cooling efficiency.

Pump designs:

- PGS: Silent external gear pump (Pump Gear Silent)
- PGSS: Super silent external gear pump (Pump Gear Super Silent)
- PGI: Internal gear pump (Pump Gear Internal)

Admissible operating mode in acc. with IEC 60034-1:

- max. 2 s, if rotational speed $n \leq n_{min.}$ (applies at motor start-up)
- S2 = 60 min., if rotational speed $n_{min.} \leq n \leq n_{nom.}$ and pressure $p \leq p_{nom.}$
- max. 10 s, if rotational speed $n = n_{max.}$ or pressure $p = p_{max.}$

Motor cooling:

- Air: in axial motor direction, air velocity $v \geq 3$ m/s, $T_{air} \leq 20$ °C

7. Water-cooled motor-pump combinations

Motor	Pump			Flow rate* [l/min]			Pressure* [bar]		Rotational speed [rpm]			Weight [kg]
	Type	Vg [ccm]		min	nom	max	nom	max	min	nom	max	approx.
159WH-07026-SHE	PGS	6	6.2	2.8	15	22	230	250	500	2,750	4,000	23
	PGSS		6.5	2.9	16	23	275	280	500	2,750	4,000	24
	PGI		6.4	1.2	16	24	250	320	200	2,750	4,200	24
	PGS	8	8.3	3.7	21	30	230	250	500	2,750	4,000	23
	PGSS		8	3.6	20	29	275	280	500	2,750	4,000	24
	PGI		7.8	1.4	20	30	250	320	200	2,750	4,200	24
	PGS	10	11.3	5.1	28	37	230	250	500	2,750	3,600	23
	PGSS		10.1	4.5	25	36	260	280	500	2,750	4,000	25
	PGI		10.8	2.0	27	39	240	320	200	2,750	4,000	24
	PGS	13	14.5	6.5	36	43	180	250	500	2,750	3,300	23
	PGSS		12.6	5.7	31	45	210	270	500	2,750	4,000	25
	PGI		13.3	2.4	33	48	200	320	200	2,750	4,000	24
	PGS	16	16.5	7.4	41	45	160	250	500	2,750	3,000	24
	PGSS		15.9	7.2	39	57	165	295	500	2,750	4,000	25
	PGI		15.6	2.8	39	57	165	295	200	2,750	4,000	24
159WH-07026-CGE	PGS	19	19.6	8.8	49	53	135	240	500	2,750	3,000	26
	PGSS		20	9.0	50	63	130	235	500	2,750	3,500	26
	PGI		19.3	1.7	48	63	135	245	100	2,750	3,600	26
	PGS	25	23.7	10.7	59	60	110	200	500	2,750	2,800	26
	PGSS		25.2	11.3	62	68	105	185	500	2,750	3,000	26
	PGI		25.2	2.3	62	82	105	185	100	2,750	3,600	26
205W-04099-SHR	PGS	6	6.2	2.8	20	22	230	250	500	3,640	4,000	27
	PGSS		6.5	2.9	21	23	275	280	500	3,640	4,000	28
	PGI		6.4	1.2	21	24	250	320	200	3,640	4,200	27
	PGS	8	8.3	3.7	27	30	230	250	500	3,640	4,000	27
	PGSS		8	3.6	26	29	275	280	500	3,640	4,000	28
	PGI		7.8	1.4	26	30	250	320	200	3,640	4,200	27
	PGS	10	11.3	5.1	37	37	205	250	500	3,600	3,600	27
	PGSS		10.1	4.5	33	36	230	280	500	3,640	4,000	28
	PGI		10.8	2.0	36	39	210	320	200	3,640	4,000	28
	PGS	13	14.5	6.5	43	43	160	250	500	3,300	3,300	27
	PGSS		12.6	5.7	41	45	185	270	500	3,640	4,000	28
	PGI		13.3	2.4	44	48	175	320	200	3,640	4,000	28
	PGS	16	16.5	7.4	45	45	140	250	500	3,000	3,000	27
	PGSS		15.9	7.2	52	57	145	295	500	3,640	4,000	28
	PGI		15.6	2.8	52	57	145	295	200	3,640	4,000	28
205W-08052-SHR	PGS	6	6.2	2.8	19	22	230	250	500	3,410	4,000	37
	PGSS		6.5	2.9	20	23	275	280	500	3,410	4,000	38
	PGI		6.4	1.2	20	24	250	320	200	3,410	4,200	37
	PGS	8	8.3	3.7	25	30	230	250	500	3,410	4,000	37
	PGSS		8	3.6	25	29	275	280	500	3,410	4,000	38
	PGI		7.8	1.4	24	30	250	320	200	3,410	4,200	37
	PGS	10	11.3	5.1	35	37	230	250	500	3,410	3,600	37
	PGSS		10.1	4.5	31	36	275	280	500	3,410	4,000	38
	PGI		10.8	2.0	33	39	250	320	200	3,410	4,000	38
	PGS	13	14.5	6.5	43	43	230	250	500	3,300	3,300	37
	PGSS		12.6	5.7	39	45	265	270	500	3,410	4,000	38
	PGI		13.3	2.4	41	48	250	320	200	3,410	4,000	38
	PGS	16	16.5	7.4	45	45	230	250	500	3,000	3,000	37
	PGSS		15.9	7.2	49	57	265	295	500	3,410	4,000	38
	PGI		15.6	2.8	48	57	250	295	200	3,410	4,000	38
205W-08052-CGR	PGS	19	19.6	8.8	60	53	235	270	500	3,410	3,000	42
	PGSS		20	9.0	61	63	230	250	500	3,410	3,500	41
	PGI		19.3	1.7	59	63	240	300	100	3,410	3,600	41
	PGS	25	23.7	10.7	73	60	195	250	500	3,410	2,800	42
	PGSS		25.2	11.3	68	68	185	210	500	3,000	3,000	42
	PGI		25.2	2.3	77	82	185	280	100	3,410	3,600	42

* Pressures and flow rates, achievable under optimum conditions, may vary depending on the electrical power supply, oil viscosity, ambient conditions and cooling efficiency.

Pump designs:

- PGS: Silent external gear pump (Pump Gear Silent)
- PGSS: Super silent external gear pump (Pump Gear Super Silent)
- PGI: Internal gear pump (Pump Gear Internal)

Admissible operating mode in acc. with IEC 60034-1:

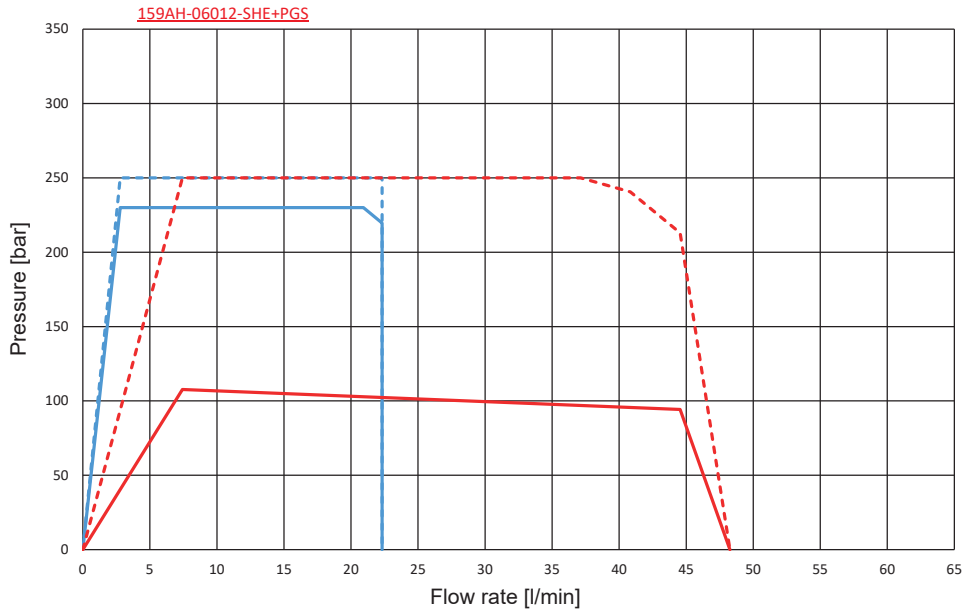
- max. 2 s, if rotational speed $n \leq n_{min.}$ (applies at motor start-up)
- S2 = 60 min., if rotational speed $n_{min.} \leq n \leq n_{nom.}$ and pressure $p \leq p_{nom.}$
- max. 10 s, if rotational speed $n = n_{max.}$ or pressure $p = p_{max.}$

Motor cooling:

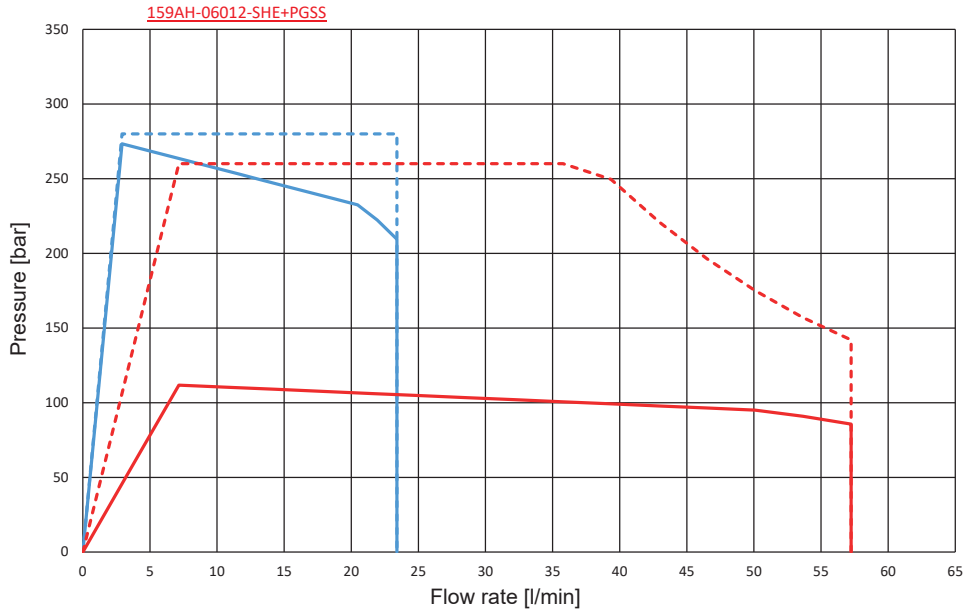
- 50:50 water-glycol mixture (in acc. with OAT): ≥ 6 l/min, $T_{feed} \leq 45$ °C

8. Motor-pump performance curves

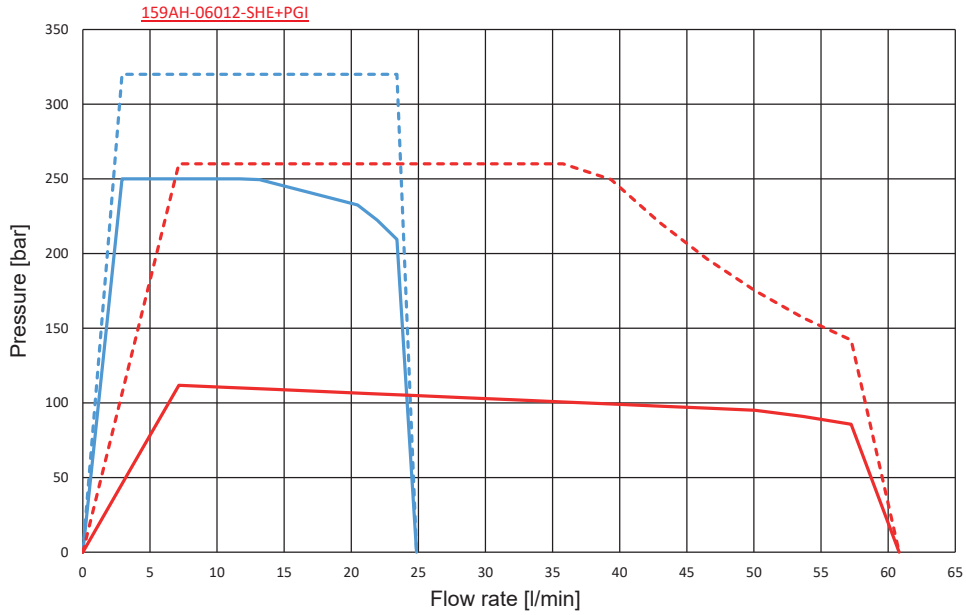
All of the following performance curves represent theoretical performance curves that may vary depending on the electrical power supply, oil viscosity, ambient conditions and cooling efficiency.



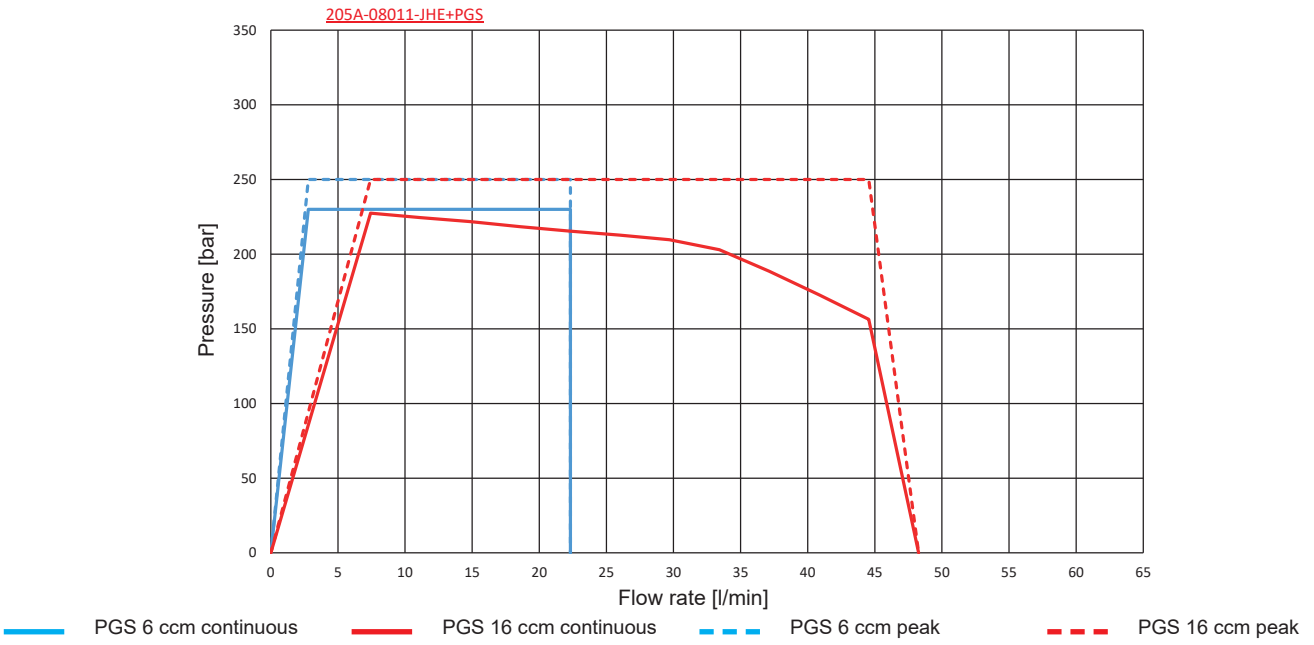
PGS 6 ccm continuous — PGS 16 ccm continuous — PGS 6 ccm peak — PGS 16 ccm peak

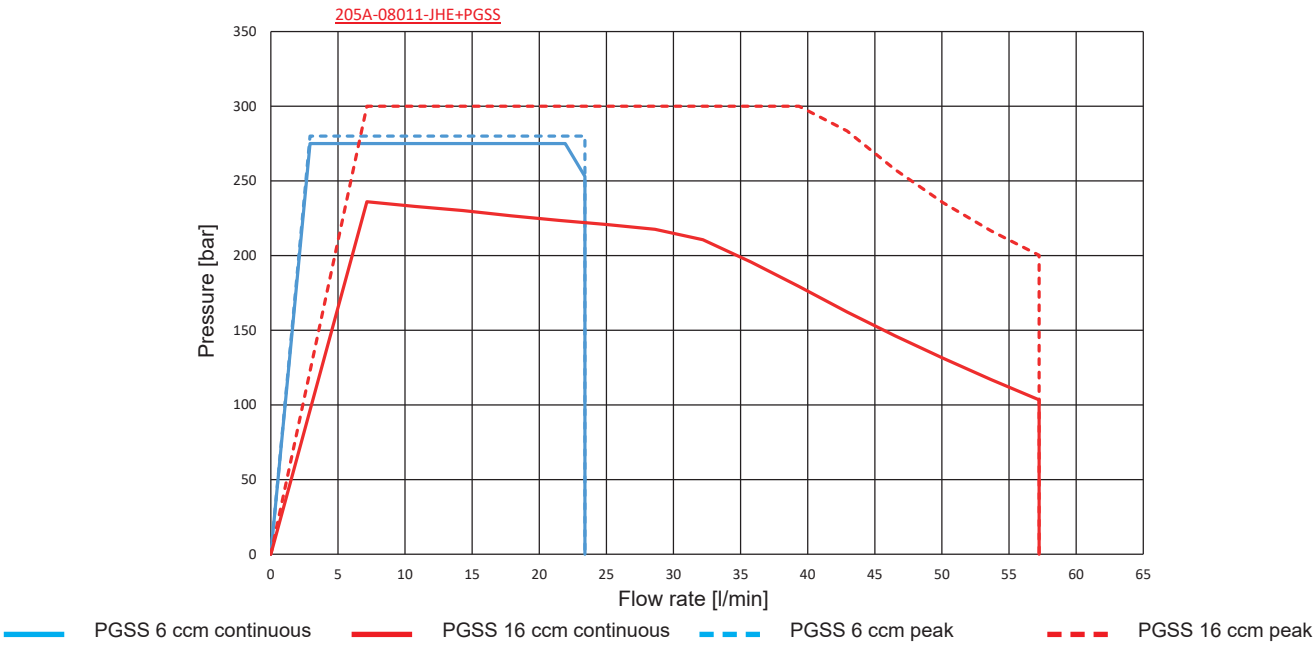


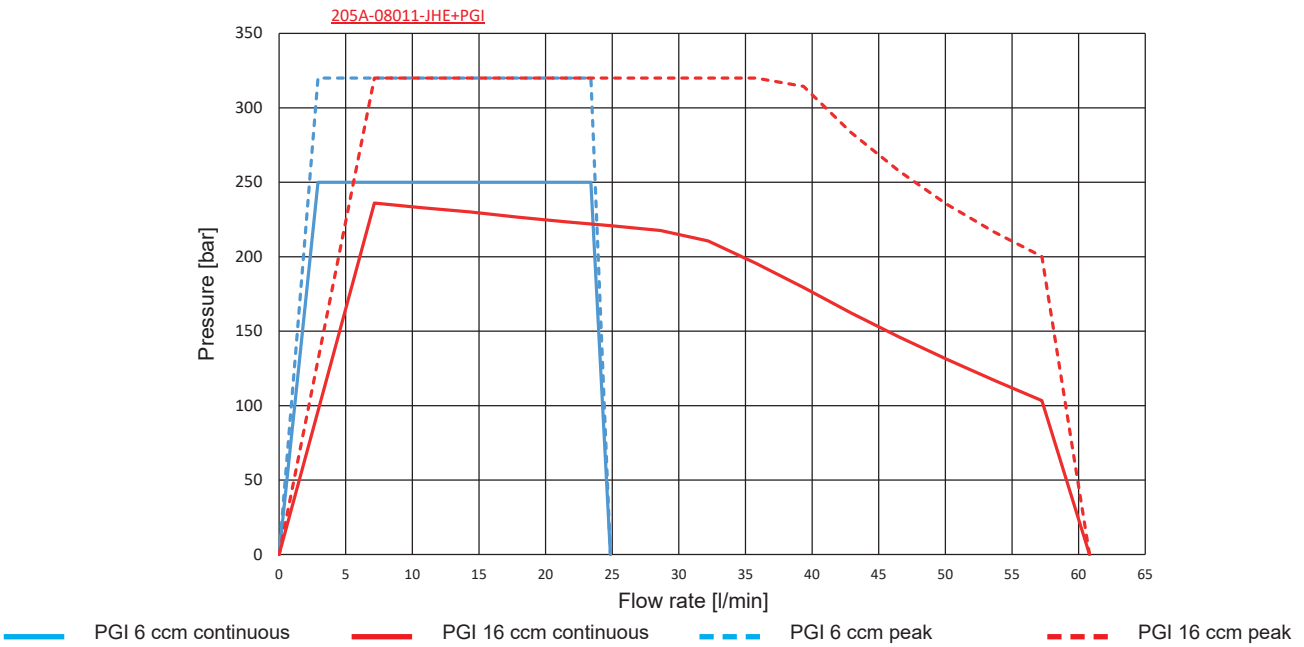
PGSS 6 ccm continuous — PGSS 16 ccm continuous — PGSS 6 ccm peak — PGSS 16 ccm peak



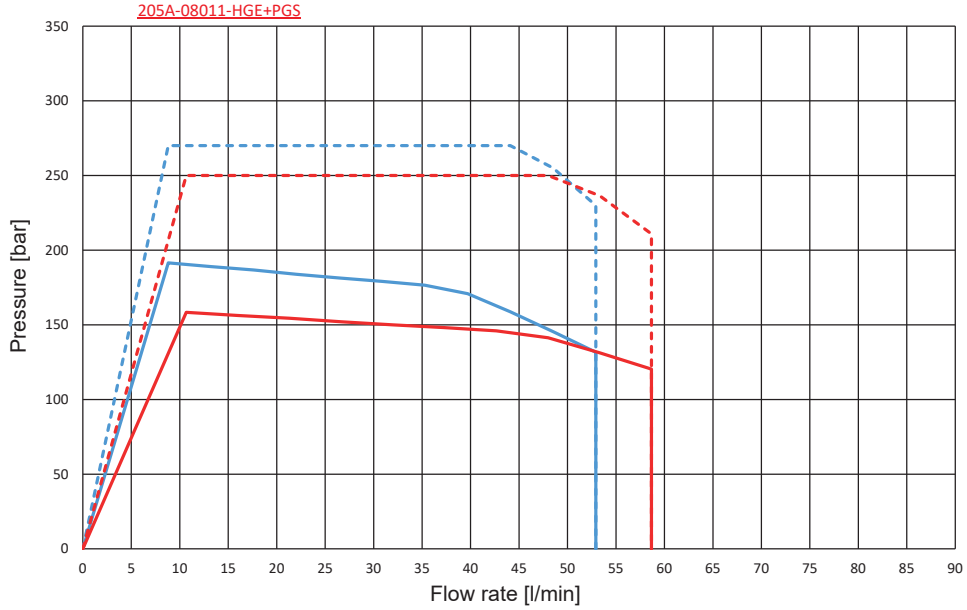
PGI 6 ccm continuous — PGI 16 ccm continuous — PGI 6 ccm peak — PGI 16 ccm peak


205A-08011-JHE+PGS
Pressure [bar]
Flow rate [l/min]
PGS 6 ccm continuous
PGS 16 ccm continuous
PGS 6 ccm peak
PGS 16 ccm peak


205A-08011-JHE+PGSS
Pressure [bar]
Flow rate [l/min]
PGSS 6 ccm continuous
PGSS 16 ccm continuous
PGSS 6 ccm peak
PGSS 16 ccm peak

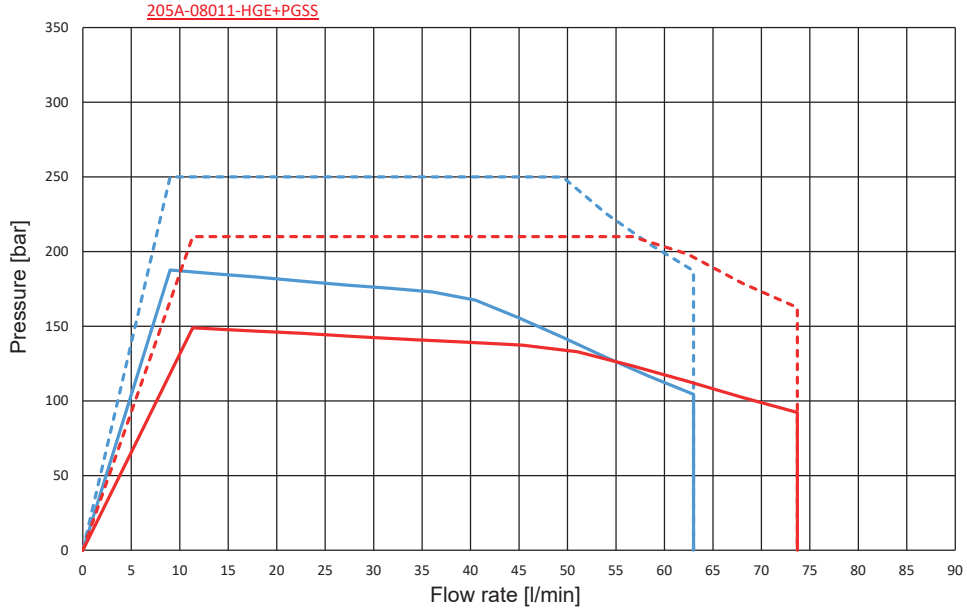

205A-08011-JHE+PGI
Pressure [bar]
Flow rate [l/min]
PGI 6 ccm continuous
PGI 16 ccm continuous
PGI 6 ccm peak
PGI 16 ccm peak

205A-08011-HGE+PGS



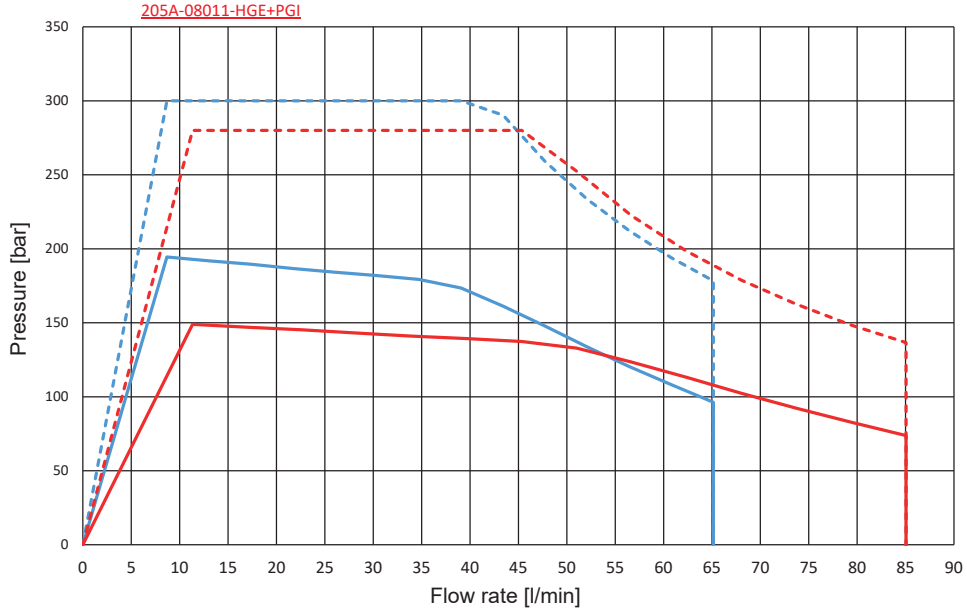
PGS 19 ccm continuous | PGS 25 ccm continuous | PGS 19 ccm peak | PGS 25 ccm peak

205A-08011-HGE+PGSS

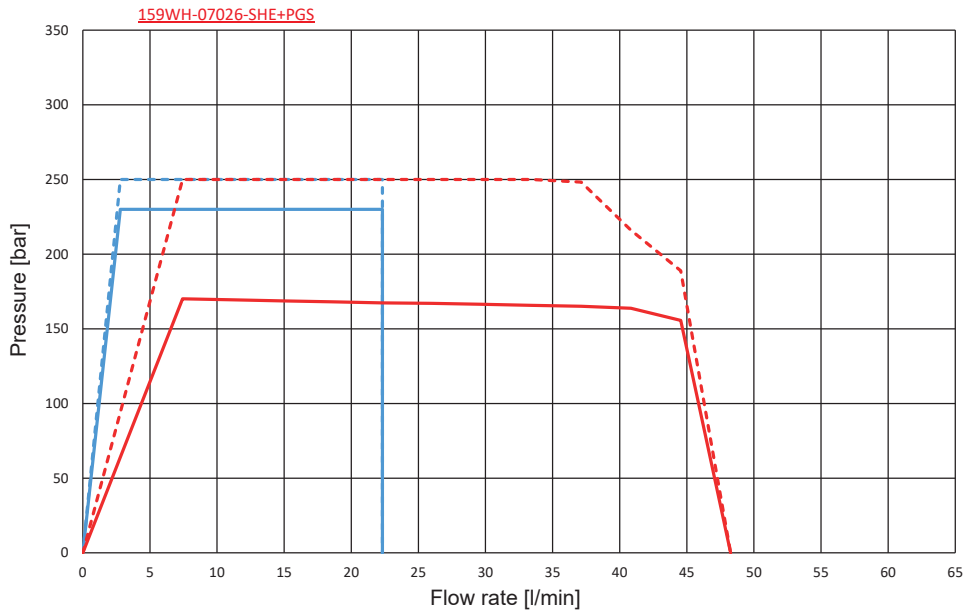


PGSS 19 ccm continuous | PGSS 25 ccm continuous | PGSS 19 ccm peak | PGSS 25 ccm peak

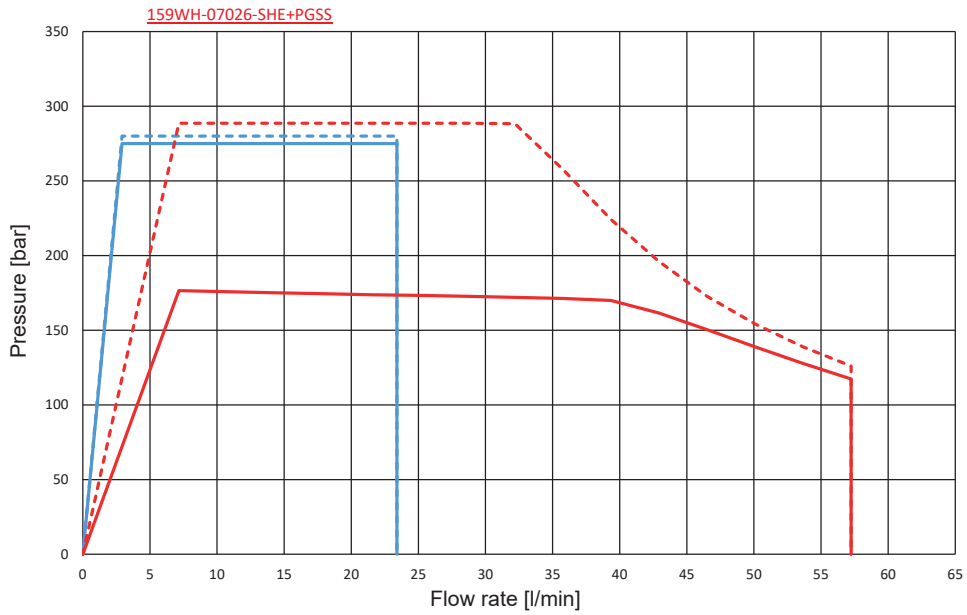
205A-08011-HGE+PGI



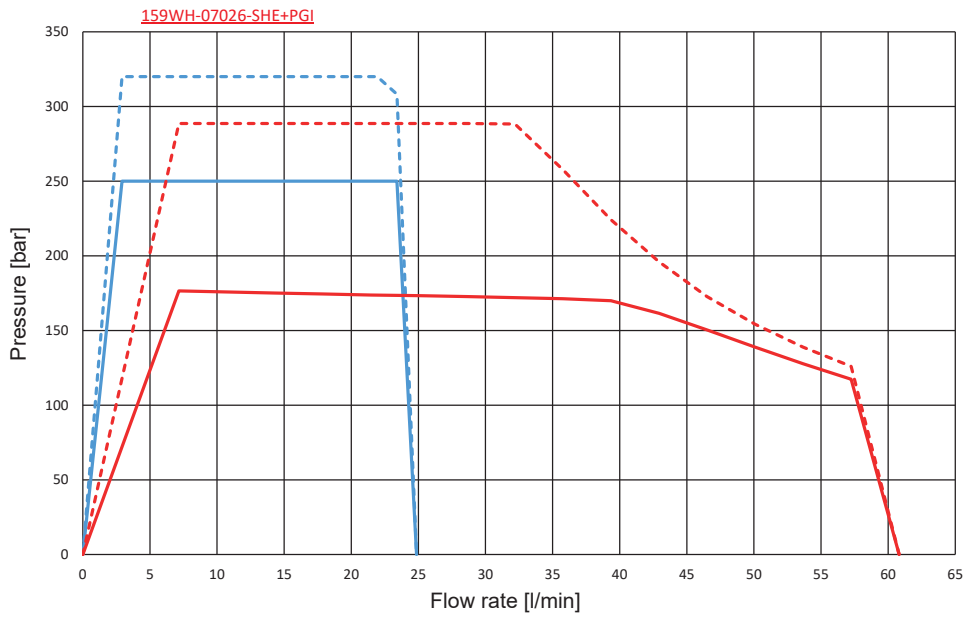
PGI 19 ccm continuous | PGI 25 ccm continuous | PGI 19 ccm peak | PGI 25 ccm peak



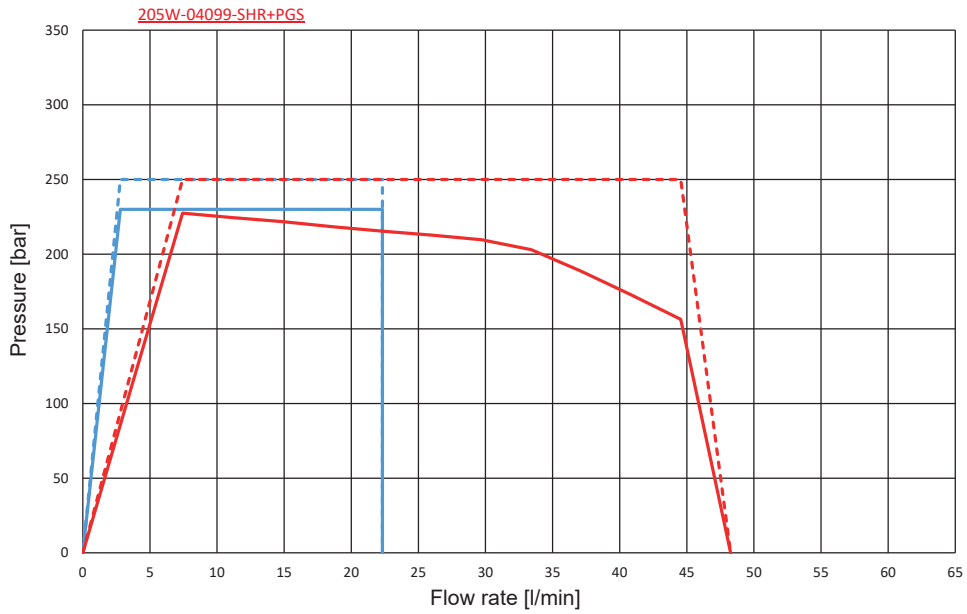
PGS 6 ccm continuous PGS 16 ccm continuous PGS 6 ccm peak PGS 16 ccm peak



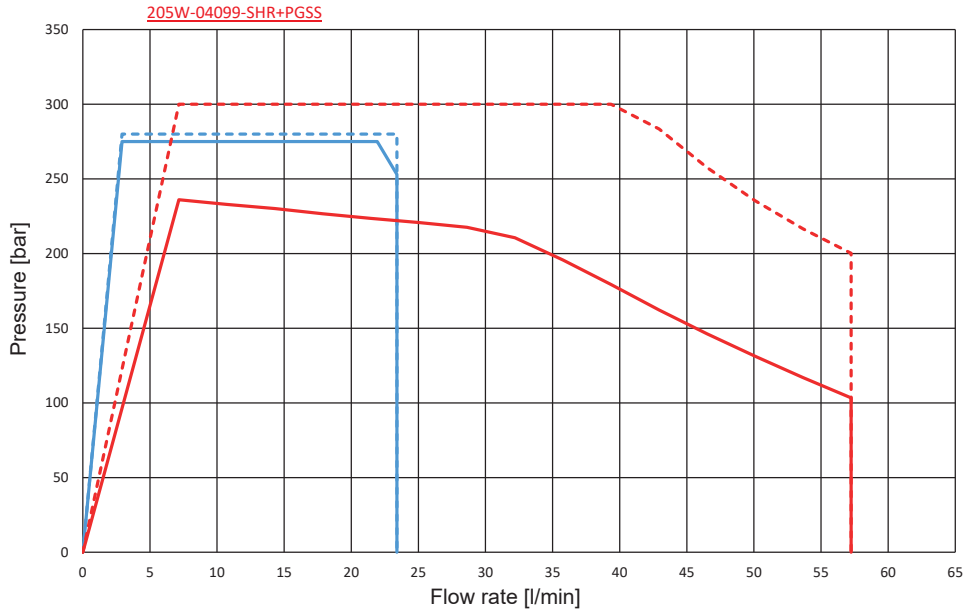
PGSS 6 ccm continuous PGSS 16 ccm continuous PGSS 6 ccm peak PGSS 16 ccm peak



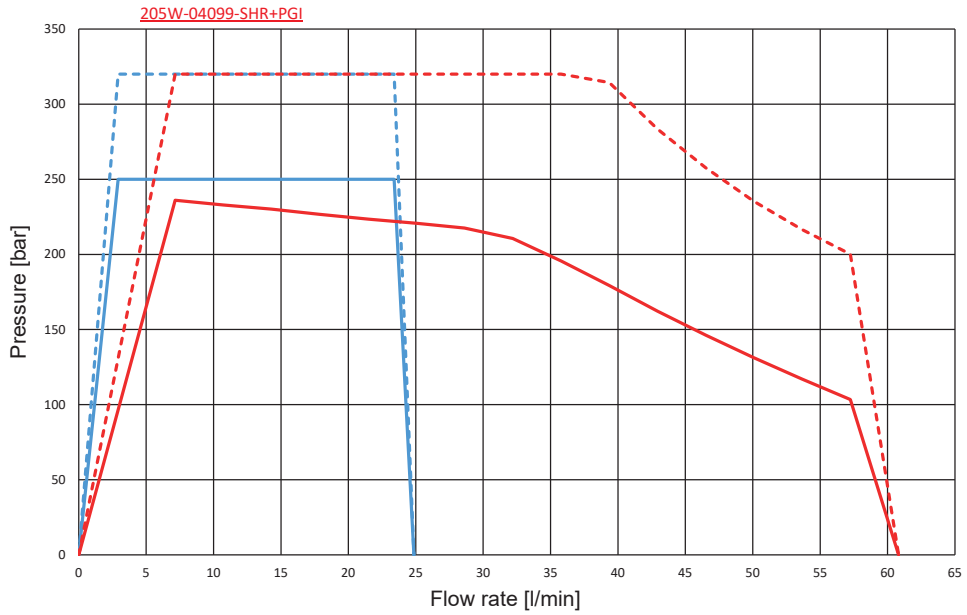
PGI 6 ccm continuous PGI 16 ccm continuous PGI 6 ccm peak PGI 16 ccm peak



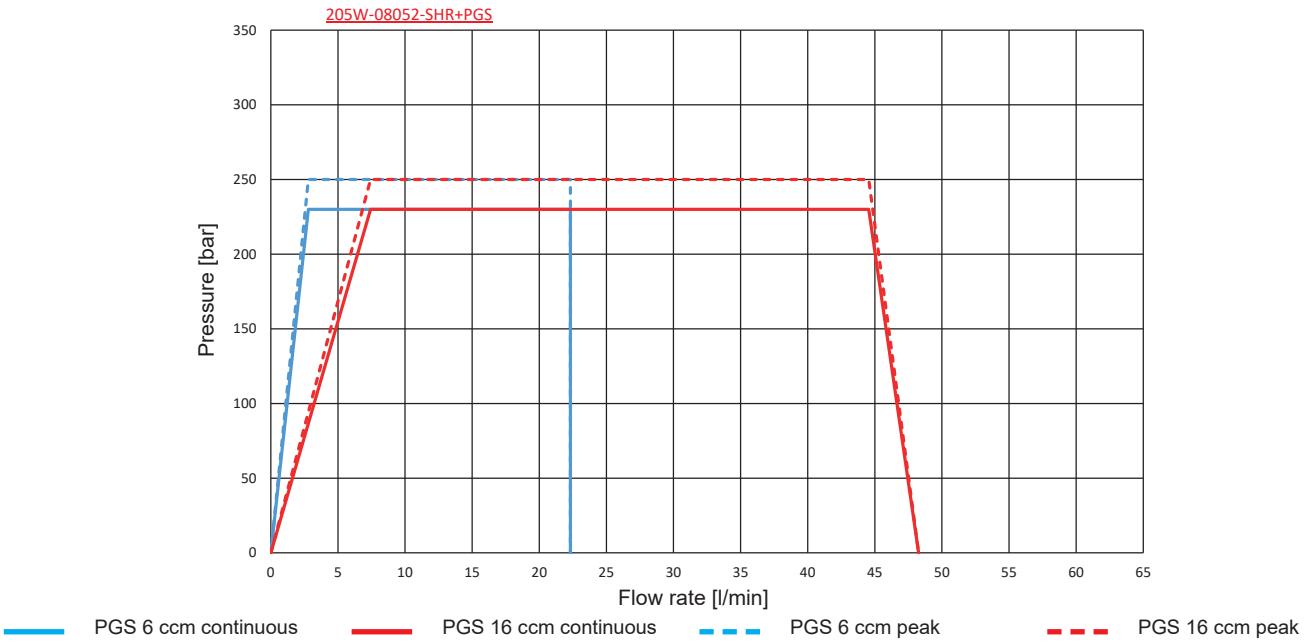
PGS 6 ccm continuous — PGS 16 ccm continuous — PGS 6 ccm peak — PGS 16 ccm peak

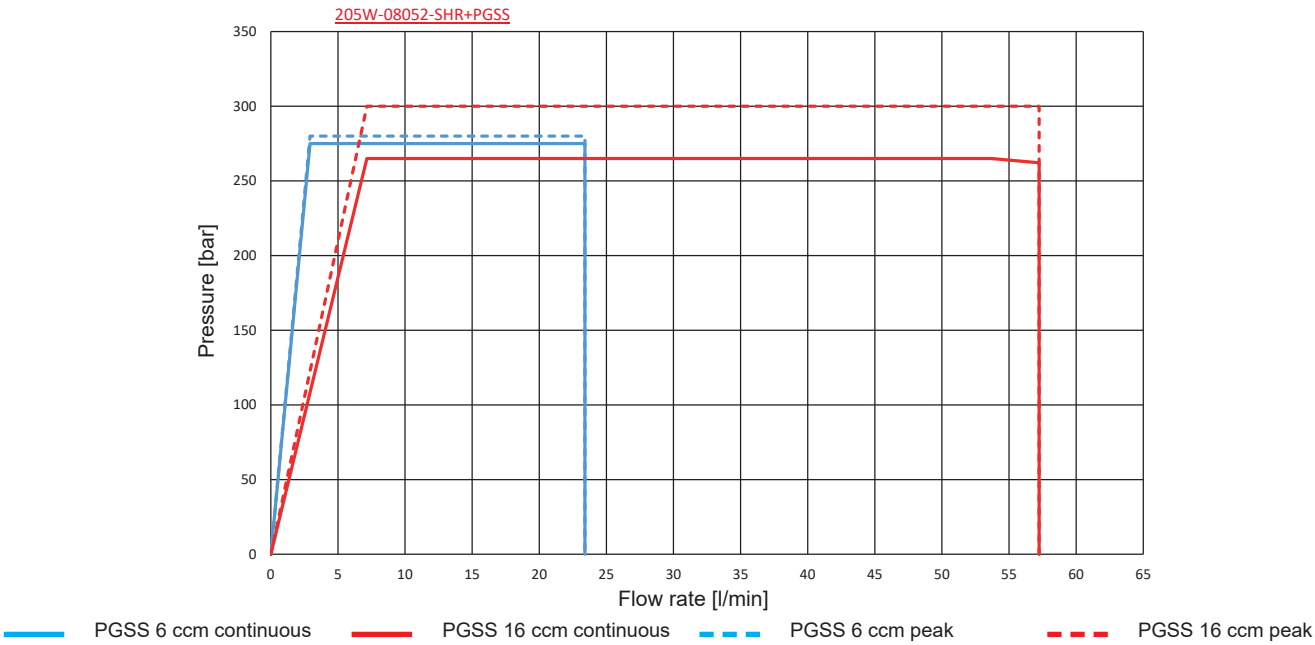


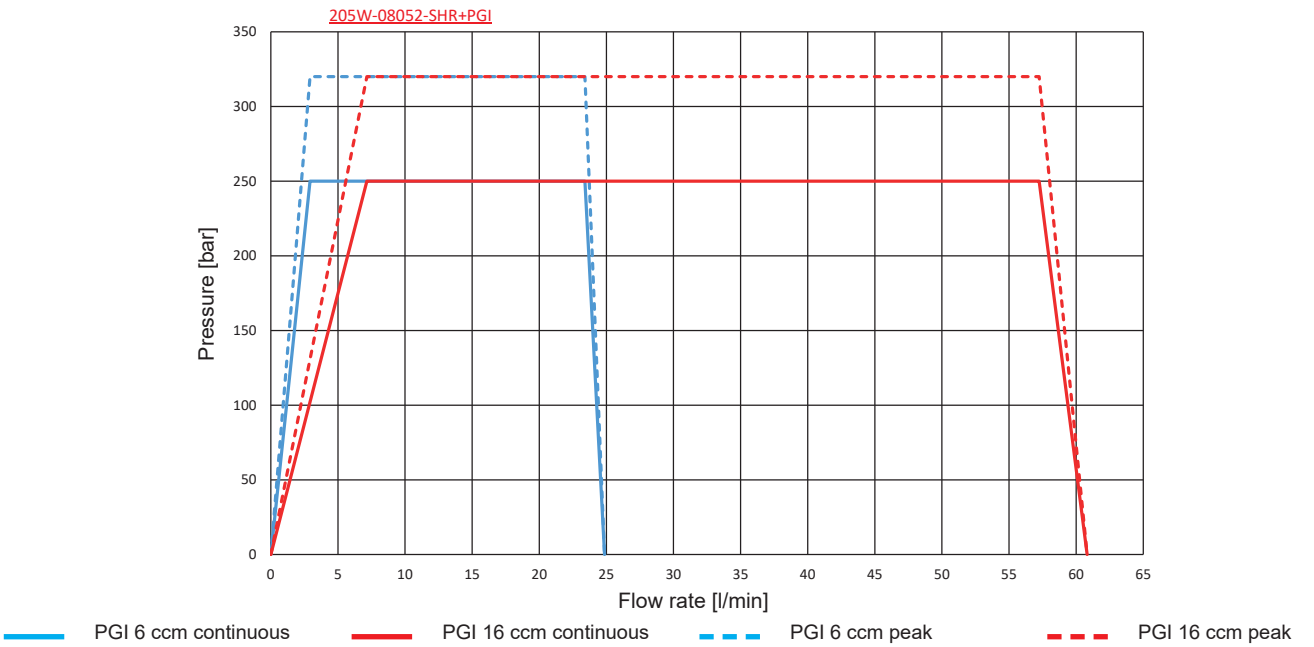
PGSS 6 ccm continuous — PGSS 16 ccm continuous — PGSS 6 ccm peak — PGSS 16 ccm peak

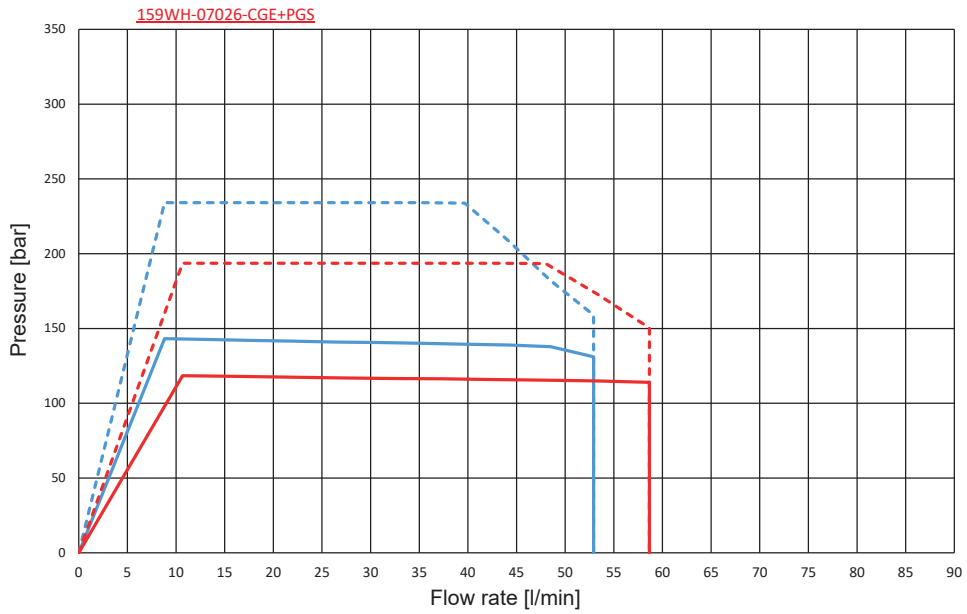


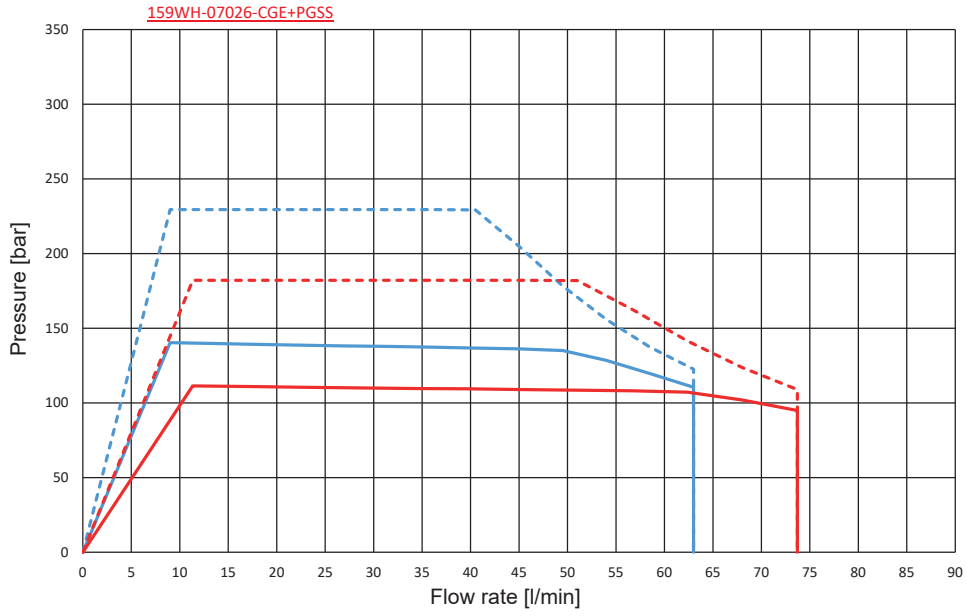
PGI 6 ccm continuous — PGI 16 ccm continuous — PGI 6 ccm peak — PGI 16 ccm peak

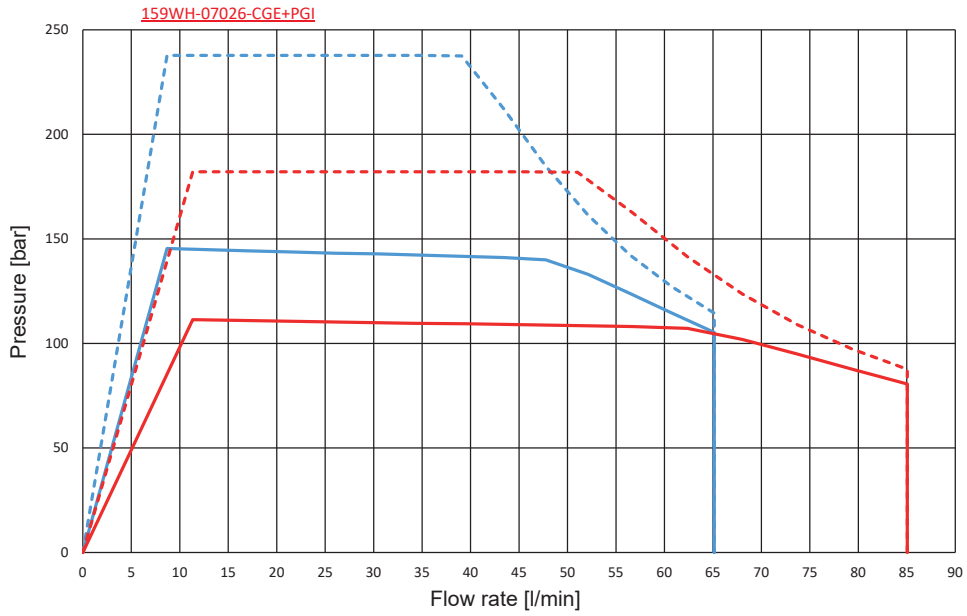

205W-08052-SHR+PGS
Pressure [bar]
Flow rate [l/min]
PGS 6 ccm continuous
PGS 16 ccm continuous
PGS 6 ccm peak
PGS 16 ccm peak

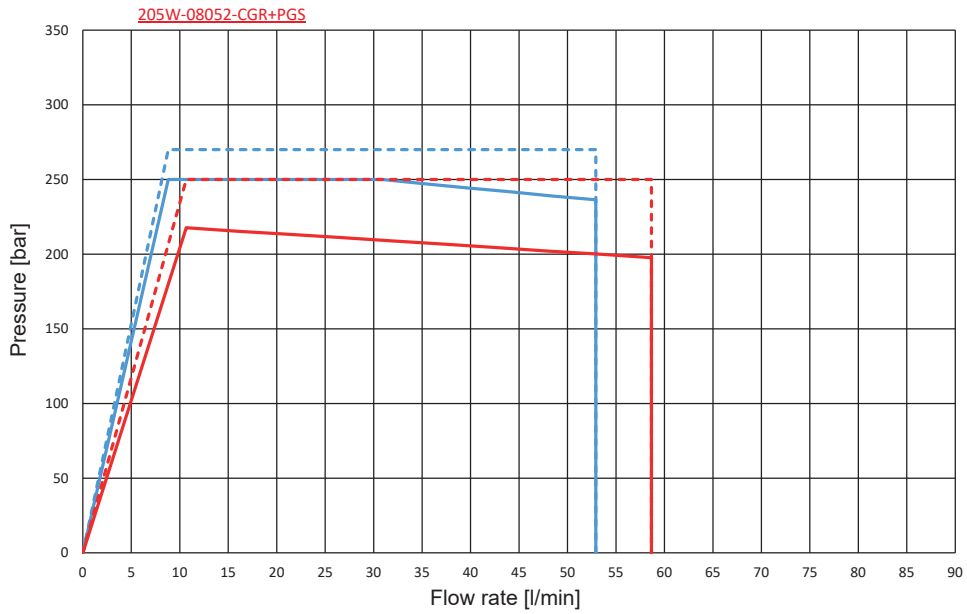

205W-08052-SHR+PGSS
Pressure [bar]
Flow rate [l/min]
PGSS 6 ccm continuous
PGSS 16 ccm continuous
PGSS 6 ccm peak
PGSS 16 ccm peak

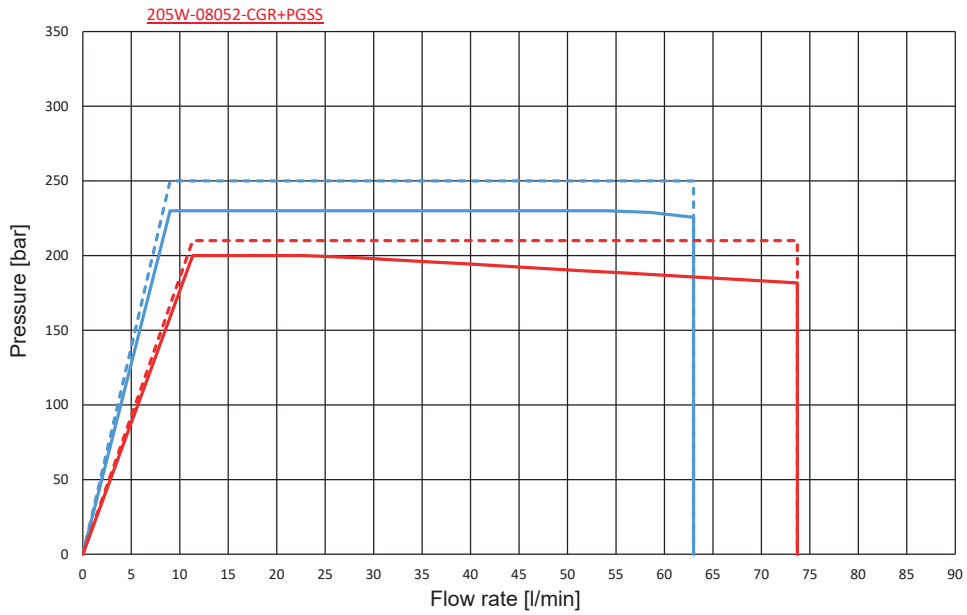

205W-08052-SHR+PGI
Pressure [bar]
Flow rate [l/min]
PGI 6 ccm continuous
PGI 16 ccm continuous
PGI 6 ccm peak
PGI 16 ccm peak

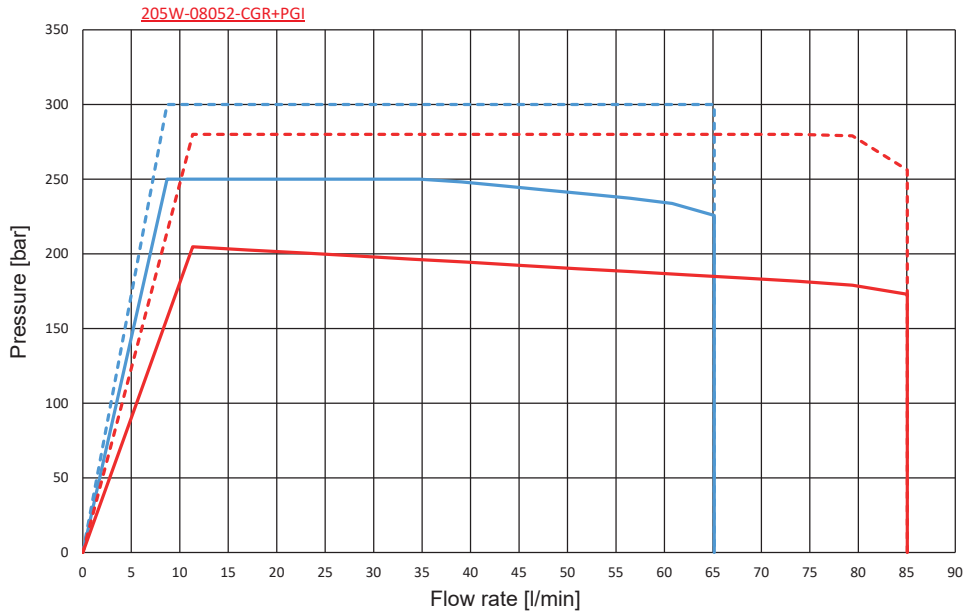

159WH-07026-CGE+PGS
Pressure [bar]
Flow rate [l/min]
PGS 19 ccm continuous
PGS 25 ccm continuous
PGS 19 ccm peak
PGS 25 ccm peak


159WH-07026-CGE+PGSS
Pressure [bar]
Flow rate [l/min]
PGSS 19 ccm continuous
PGSS 25 ccm continuous
PGSS 19 ccm peak
PGSS 25 ccm peak


159WH-07026-CGE+PGI
Pressure [bar]
Flow rate [l/min]
PGI 19 ccm continuous
PGI 25 ccm continuous
PGI 19 ccm peak
PGI 25 ccm peak

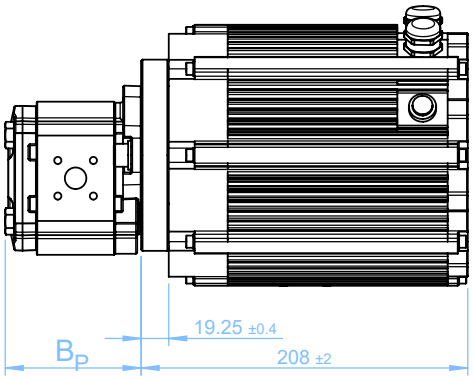

205W-08052-CGR+PGS
Pressure [bar]
Flow rate [l/min]
PGS 19 ccm continuous
PGS 25 ccm continuous
PGS 19 ccm peak
PGS 25 ccm peak

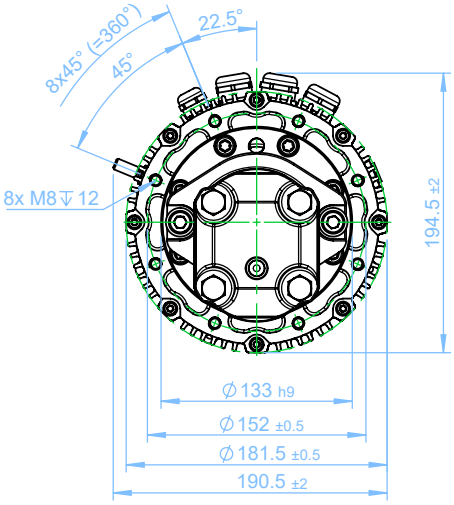

205W-08052-CGR+PGSS
Pressure [bar]
Flow rate [l/min]
PGSS 19 ccm continuous
PGSS 25 ccm continuous
PGSS 19 ccm peak
PGSS 25 ccm peak


205W-08052-CGR+PGI
Pressure [bar]
Flow rate [l/min]
PGI 19 ccm continuous
PGI 25 ccm continuous
PGI 19 ccm peak
PGI 25 ccm peak

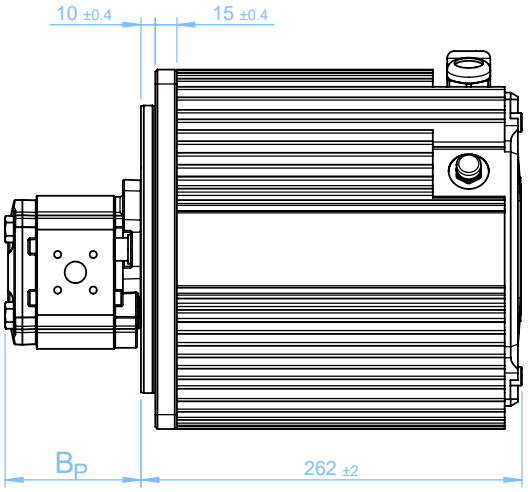
9. Motor/pump dimensions – examples

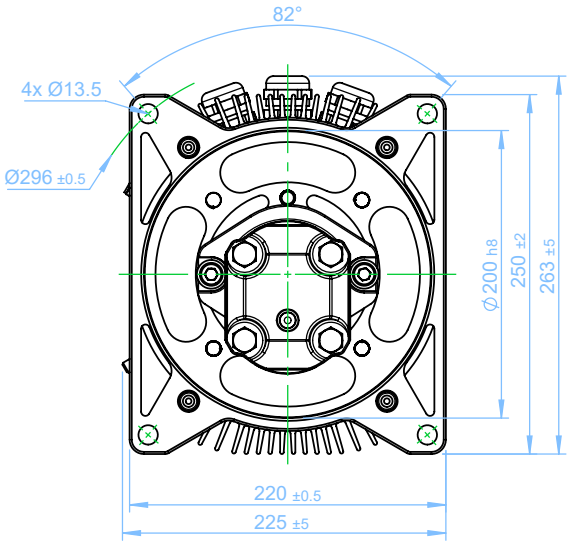
159AH-06012-SHE





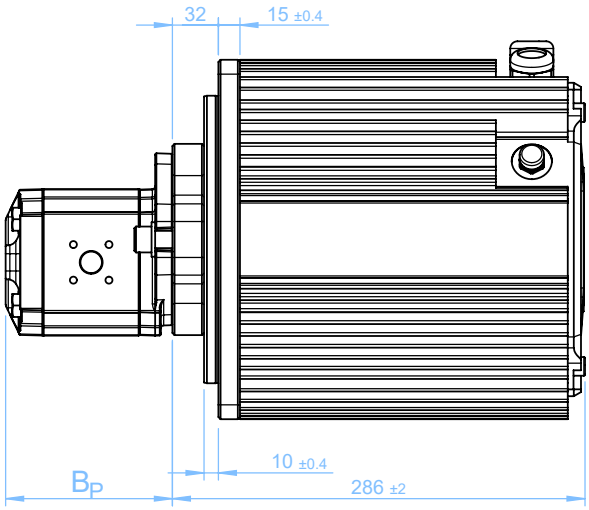
205A-08011-JHE

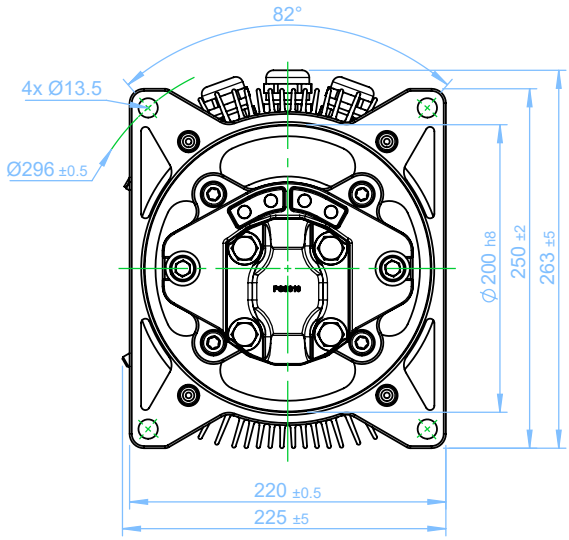




Pump type	B_P max [mm] ±1				
	6	8	10	13	16
PGS	97	97.5	102.5	106.5	116.5
PGSS	97.5	100.5	104.5	109.4	114.4
PGI	103.5	106.5	112.5	117.5	122.5

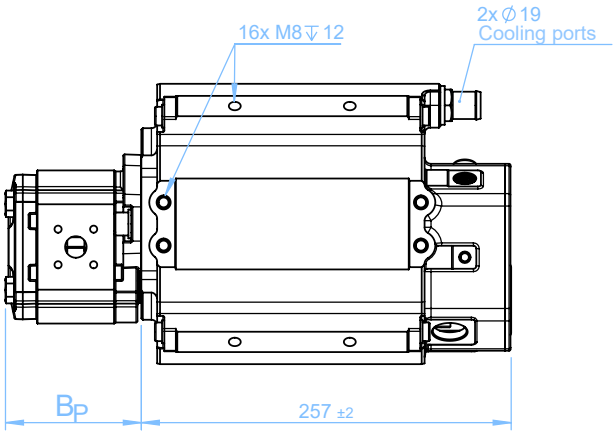
205A-08011-HGE

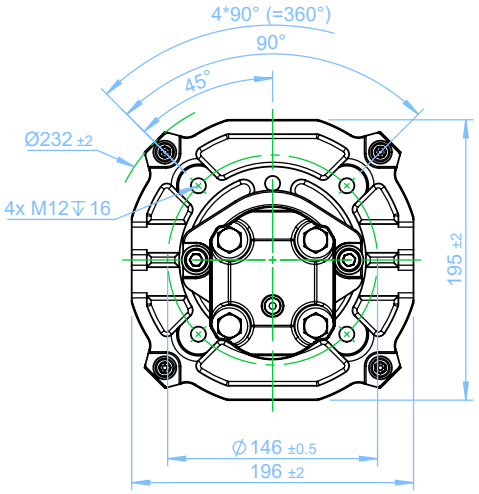




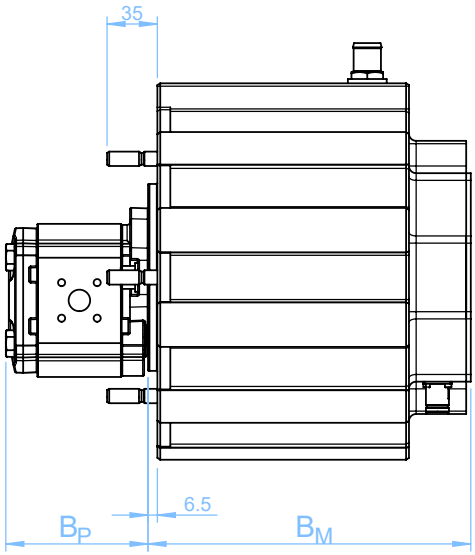
Pump type	B_P max [mm] ±1	
	19	25
PGS	117	130
PGSS	116	129.5
PGI	129.5	141.5

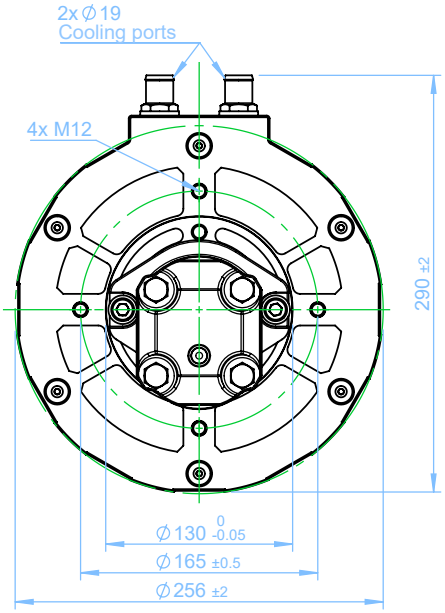
159WH-07026-SHE





205W-XXXXX-SHR

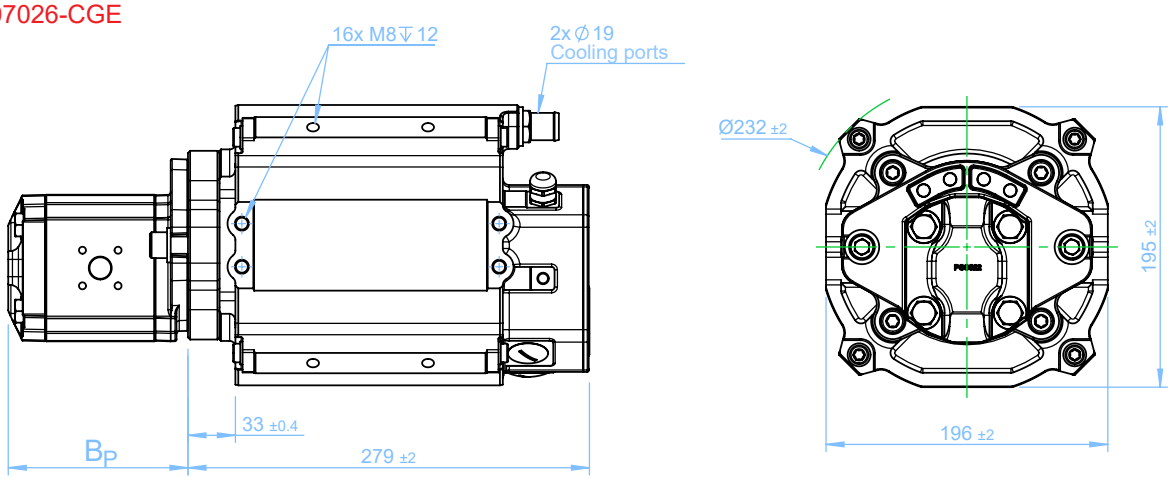




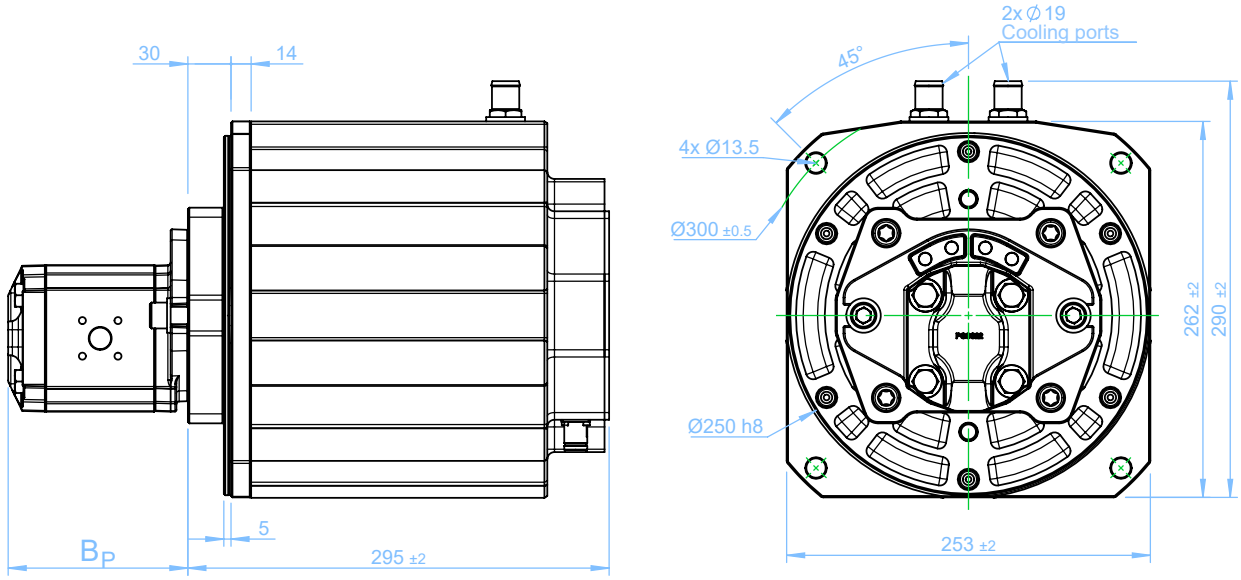
Pump type	B_P max [mm] ±1				
	6	8	10	13	16
PGS	97	97.5	102.5	106.5	116.5
PGSS	97.5	100.5	104.5	109.4	114.4
PGI	103.5	106.5	112.5	117.5	122.5

Motor type	B_M [mm] ±2
205W-04099-SHR	226
205W-08052-SHR	266

159WH-07026-CGE



205W-08052-CGR



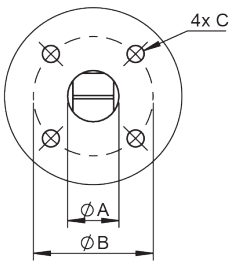
Pump type	B_P max [mm] ±1	
	19	25
PGS	117	130
PGSS	116	129.5
PGI	129.5	141.5

Pump drilling pattern

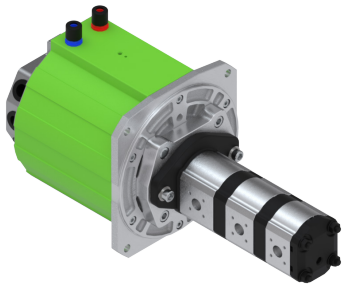
Pump drilling pattern – suction side				
Pump design	Vg [ccm]	A [mm]	B [mm]	C
PGS	6; 8, 10; 13; 16	20	40	M6x12
	19; 25	26	55	M8x12
PGSS	6; 8; 10; 13; 16	20	40	M6x12
	19; 25	26	55	M8x12
PGI	6; 8; 10; 13; 16	20	40	M6x12
	19; 25	26	55	M8x12

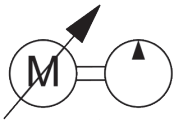
Pump drilling pattern – pressure side				
Pump design	Vg [ccm]	A [mm]	B [mm]	C
PGS	6; 8, 10; 13; 16	15	35	M6x12
	19; 25	18	55	M8x12
PGSS	6; 8; 10; 13; 16; 19; 25	15	35	M6x12
PGI	6	5	35	M6x12
	8	7		
	10; 12	10		
	16; 19; 25	12		

Pump drilling pattern suction side / pressure side

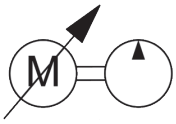


10. Motor/pump illustrations – examples

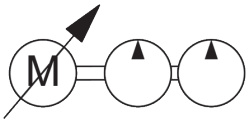




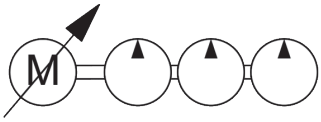
159AH-06012-SHE
PGS8



159WH-07026-CGE
PGS19



205A-08011-JHE
PGS8/8



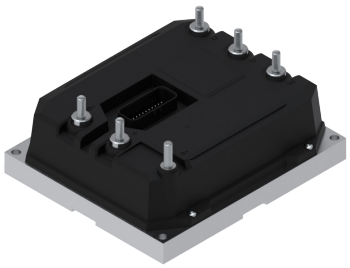
205W-08052-CGR
PGS8/8/8

11. Inverter overview

Cooling inverter	Inverter-code	Unom [VDC]	I max [A] S2 = 2 min	I max [A] S2 = 60 min	Connector	Protection class	Bus protocol	Weight [kg]
Air-cooled	Z48/4	48	1000	500	AMP35	IP65	CANopen	5.3
	Z96/4	96	545	350	AMP35	IP65	CANopen	5.3
Water-cooled	Z350	350 (max. 420)	120 (60 sec)	90 (S1)	Molex CNC 48P	IP6k9k	CANopen	5.6

12. Inverter illustrations

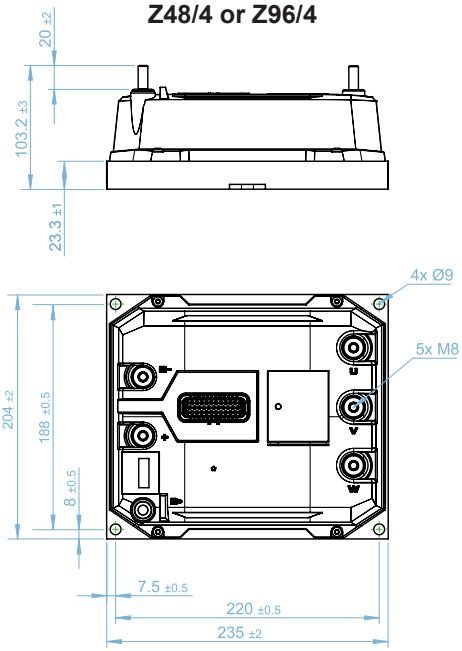
Z48/4 or Z96/4



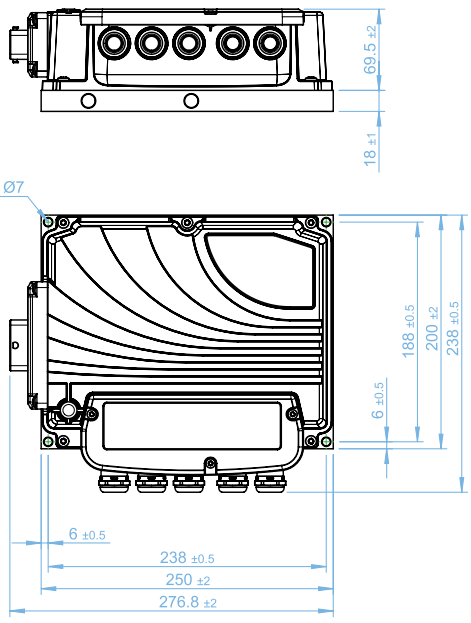
Z350

13. Inverter dimensions

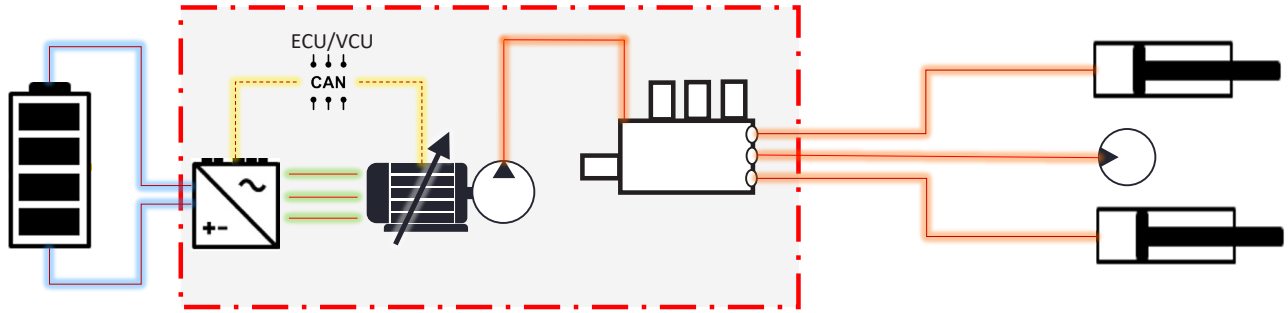
Z48/4 or Z96/4



Z350



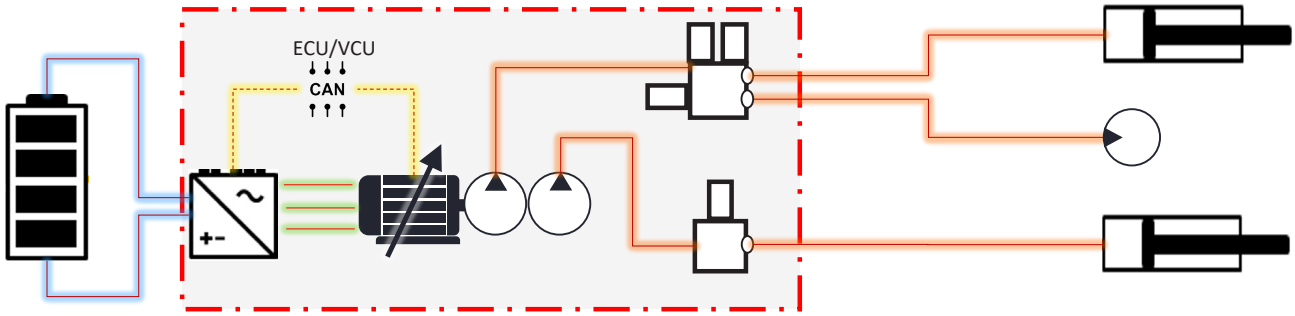
14. Application example with single pump and external control block

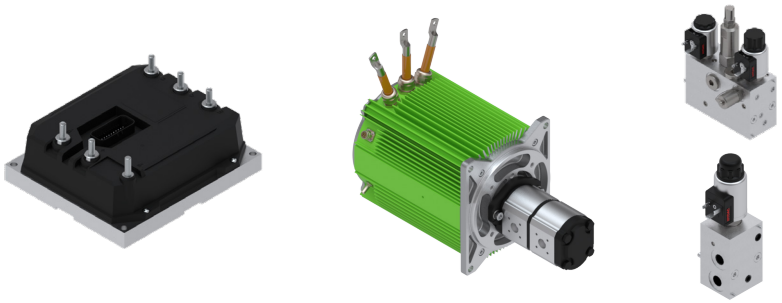


Advantages:

- Existing system architectures can be widely adopted
- Flexible, thanks to different installation areas for motor and control block
- Control block can be installed as close as possible to the consumer

15. Application example with double pump and two external control blocks

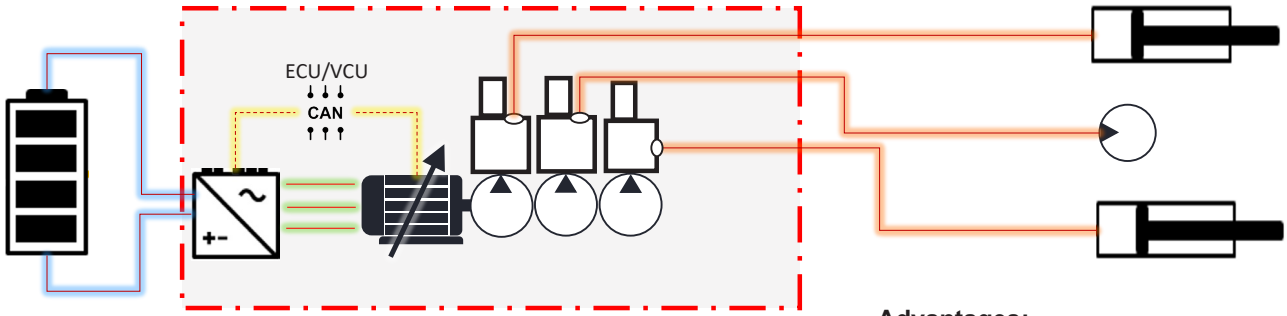


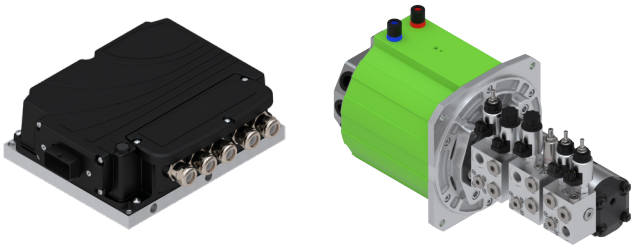


Advantages:

- Reduced power losses thanks to two separate hydraulic circuits with different pressure levels
- Flexible, thanks to different installation areas for motor and control blocks
- Control blocks can be installed as close as possible to the consumer

16. Application example with triple pump and three flange-mounted control blocks





Advantages:

- Reduced power losses as a result of up to three separate hydraulic circuits with different pressure levels
- Compact overall unit
- Every control block performs one function independently in the machine

17. Safety information and documentation

Safety information for operation

- The power pack is intended for mobile use only, do not use for purposes other than intended
- The power pack is partly completed machinery in accordance with Machinery Directive 2006/42/EC and is exclusively intended to be installed in another machine or combined with other partly completed machines
- Do not exceed the maximum permitted operating pressure
- Power packs and attachments can become hot during operation – risk of injury!
- Electrical and electronic components may be replaced and connected exclusively by instructed electricians. Electrical installation and maintenance must be performed in accordance with the relevant safety regulations for electrical engineering
- Make sure the power pack is de-energised before working on it. Direct or indirect contact with live components can lead to injury or death
- PE connections must be integrated within the protection system of the complete machine in order to avoid the possibility of parts becoming energised in the event of a fault
- Inverter, motor and other electrical components can have various degrees of protection

Requirements for the surrounding area

- Permitted ambient temperature range of -20 °C to +40 °C
- To avoid excessive noise, use anti-vibration mounts and avoid mounting the units on resonating surfaces
- To prevent vibration transfer, hoses must be used wherever possible when connecting the power pack
- Adequate ventilation or coolant must be provided for heat dissipation, depending on the type of cooling in place

Refer also to drawing no. 4676554 in the HYDAC operating manual

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.

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