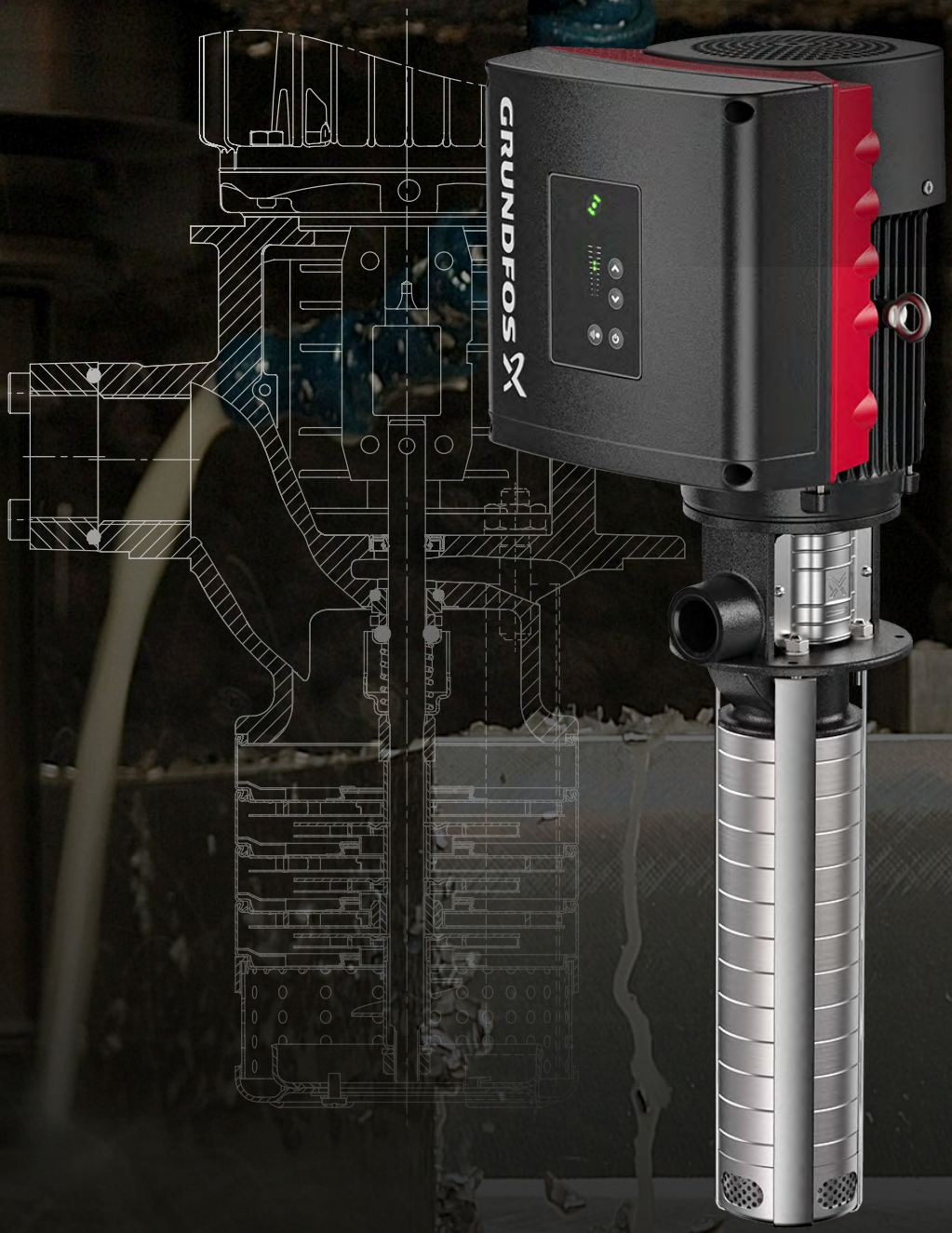
MTRE IMMERSIBLE PUMPS 50/60 Hz



be
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innovate

GRUNDFOS

MTRE IMMERSIBLE PUMPS 50/60 Hz

MTRE pumps are MTR pumps with an E-motor, i.e. a motor with built-in frequency control. Frequency control enables continuously variable control of motor speed, which makes it possible to set the pump to operate in any duty point. The motors of the MTRE pumps are Grundfos MGE motors designed to EN standards.

MTRE pumps are ideal for machining centres which operate with different machining processes and tools, as this will often result in different needs for flow and pressure.

THE FOLLOWING FEATURES AND BENEFITS ARE TYPICAL FOR CHOOSING AN MTRE PUMP:

- energy savings
- low heat input into the cooling lubricant
- increased cooling efficiency
- better performance of the machining centre
- simple integration with the machining centre.


GRUNDFOS

APPLICATION

MACHINE TOOL APPLICATIONS

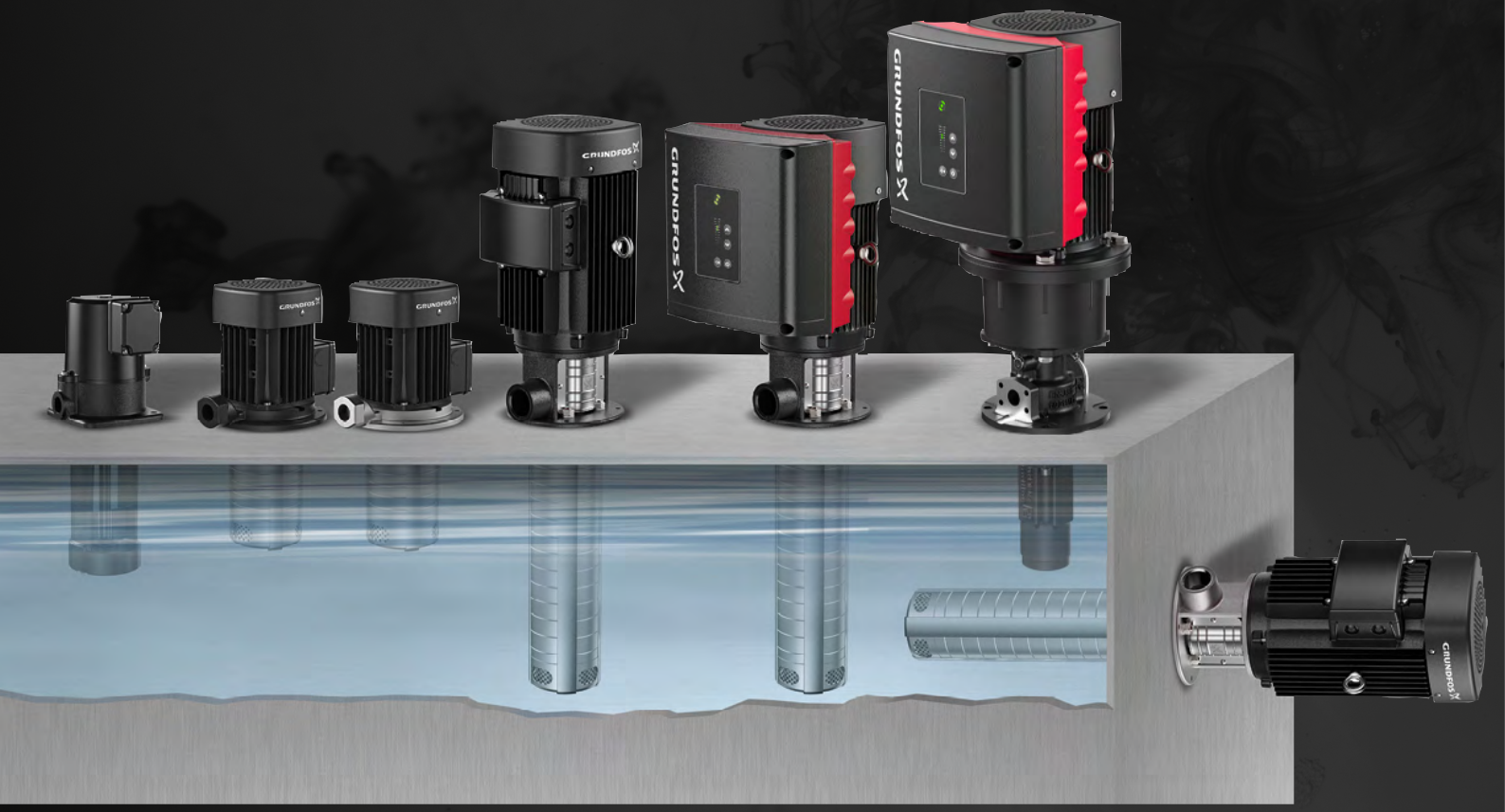
Grundfos' range of high-pressure pumps offers unsurpassed accuracy and stability to make sure that nothing interferes with the delicate machining process. Equally important, high efficiency ensures a remarkably low heat input into the cooling lubricant. Intergrated frequency converters can be optionally supplied for increased system efficiency and flexibility. Pumps suitable for machine tool applications are the immersible MTRE and MTSE, offering a tank mounted design.

MACHINE TOOL SUB APPLICATIONS

- Boring
- Milling and Turning
- Wire Cutting
- Filtration
- Part Washing
- Chilling
- Condensate Systems
- Wash and Clean

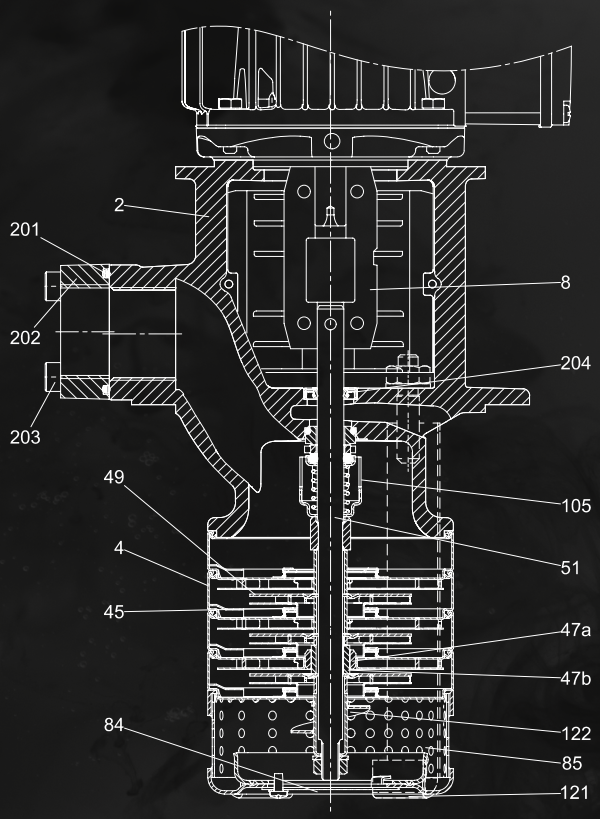
OTHER APPLICATIONS

- Industrial process
- Utility systems



PRODUCT FEATURES AND BENEFITS

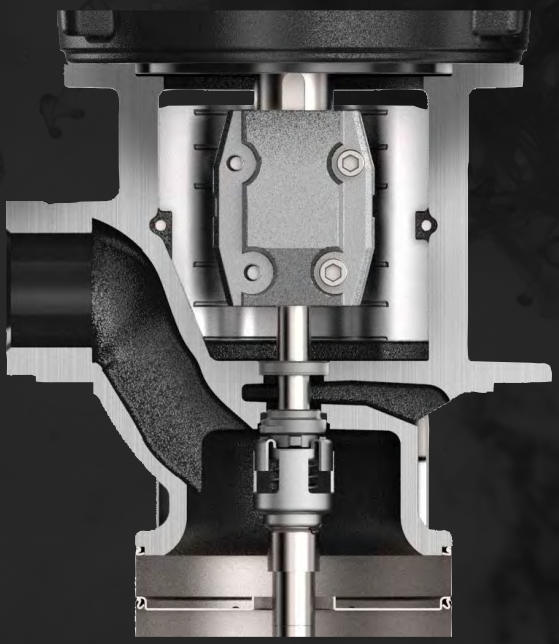
		A Version		
POS	**Description**	**Materials**	**EN/DIN**	**AISI/ASTM**
2	Pump Head	Cast iron	EN-GJL-200	ASTM 25B
4	Chanmber	Stainless steel	1.4301	AISI 304
8	Coupling	Sintered metal	-	-
45	Neck ring	PTFE	-	-
47a	Bearing ring, stationary	Silicon carbide	-	-
47b	Bearing ring, rotating	Silicon carbide	-	-
49	Impeller	Stainless steel	1.4301	AISI 304
51	Pump Shaft	Stainless steel	1.4401	AISI 316
84	Suction Strainer	Stainless steel	1.4301	AISI 304
85	Strainer Internal	Stainless steel	1.4301	AISI 304
105	Shaft Seal	AQQV/AQQE	-	-
121	Strap	Stainless steel	1.4301	AISI 304
122	Priming Screw	Stainless steel	1.4301	AISI 304
201	O-ring	NBR	-	-
202	Counter flange	Cast iron	EN-GJL-200	ASTM 25B
203	Bolt	Stainless steel	-	-
204	Lip seal	FKM	-	-



The pumps are available in different materials on request. (e.g. stainless steel with all wetted parts of stainless steel EN/DIN 1.4301/1.4401)

MTRE – DRAINAGE BACK TO TANK

Leak-free pumps are a top priority in any industrial process. Leaking pumps may lead to costly downtime and in turn affect part cost. The MTRE DBT (Drainage Back to Tank) pump effectively eliminates that risk, as the liquid remains in the tank where it is supposed to be – even if the shaft seal is worn out and starts to leak. In addition to being leak-free, the MTRE DBT pump features an innovative frequency drive motor that reduces energy consumption to reduce further part costs.



- Downtime risk due to leakage is eliminated
- No risk of contamination
- Longer service intervals
- Reduction of part costs
- Non-sticking solution for the shaft seal on startup

Both the stationary and rotating bearing ring are made of silicon carbide material. Grundfos offers a wide range of mechanical shaft seals with different seal faces such as Silicon Carbide, Carbon and Tungsten Carbide to handle almost any industrial liquid.

IN A CLASS OF THEIR OWN

MOTOR SPECIFICATIONS FOR MGE

MGE MOTOR SIZE (MTRE)

Mounting Designation	Up to 4 kW	V18
	5.5 – 22 kW	V1
Efficiency Class	0.37 -11 kW	IE5
	15 – 22 kW	IE3
Insulation Class		F
Supply Voltage (- 10 %/+ 10 %)	0.37 – 1.5 kW	1 x 200-240 V
	1.1 – 5.5 kW	3 x 200-240 V
	0.37 – 11 kW	3 x 380-500 V
	15 – 22 kW	3 x 380-480 V
Environmental Limits	Degree of protection	IP55/IP66 according to EN60529
	Operating temperature	-20 to +60°C, derating above +50°C
	Storage/transport temperature	-30 to +60°C
	Altitude	0-1000m without derating
	Humidity	0-95%, non-condensing

*If the ambient temperature exceeds the above maximum ambient temperatures or the pump is installed at an altitude exceeding 1000 metres, the motor must not be fully loaded due to the risk of overheating. Overheating may result from excessive ambient temperatures or the low density and consequently low cooling effect of the air. In such cases, it may necessary to use a motor with a higher rated output.a

MGE MOTORS, MOTOR PROTECTION

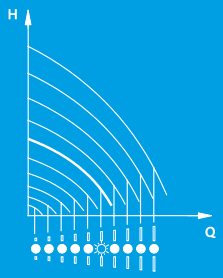
MGE motors incorporate thermal protection against slow overload and blocking (IEC 34-11: TP 211)

COMPLIANCE

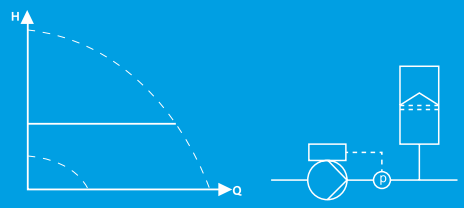
Conformity to standards	MGE: CE, EAC, RCM, CCC, and cURus
Harmonics	IEC/EN 61000-3-12
EMC	Low speed motors ≤4kW and Medium/ high speed motors ≤5.5kW: Category C1 according to EN 61800-3, corresponding to CISPR 11, class B, group 1 (residential areas) All other: Category C3 according to EN61800-3, corresponding to CISPR 11, class A, group 2

CONTROL MODE

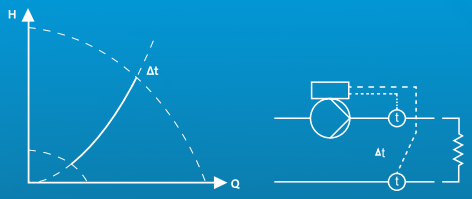
CONSTANT CURVE



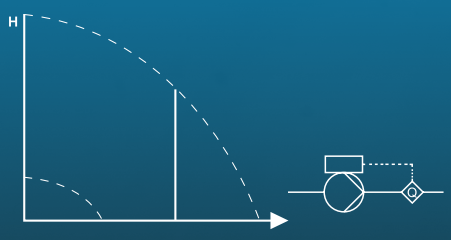
CONSTANT PRESSURE



CONSTANT DIFFERENTIAL TEMPERATURE



CONSTANT FLOW



PLUG-AND-PUMP INTEGRATION

The Grundfos E-pump with a built-in frequency converter that enables variable-speed operation with the following benefits in pump applications:

- energy savings
- process control
- extra functionalities
- built-in motor protection
- higher performance and more compact pumps
- reduced water hammer due to long ramp times
- low starting currents

WHY CHOOSE AN E-PUMP ?

E-pumps provide a range of benefits over standard motors such as:

- The motor and frequency converter are perfectly matched for troublefree operation.
- Reduced CAPEX in installed components and wiring costs.
- Purchase the complete system through Grundfos for easy customer service.
- Dedicated functionality for specific pump applications – no further programming required.
- Predefined intelligent control modes such as constant pressure, proportional pressure, and constant level, make it easy to fit the pump into any application.
- Meets EMC standards making it suitable for residential purpose buildings – without an intermediate transformer.
- Wide variety of motor mounting with flanges / shafts / feet all according to IEC and NEMA standards – customised combinations can be delivered as required.
- Low acoustic noise levels make it suitable for use in building services compared to similar competitor products.
- Advanced I/O and functionality can often remove the need to use an additional external controller or PLC to control the system

CONTROL MODES FOR E-PUMPS

Grundfos provides MTRE with MGE with built-in frequency converter and PI controller that enables variable-speed operation in different control modes with different I/O.

MTRE

MTRE pumps are suitable in these situations:

- Where uncontrolled operation is required.
- When there is a need to control the flow rate, temperature, differential temperature, liquid level, pH value, etc.

MGE 0.37 TO 11 KW

These MTRE pumps an be set to either of these control modes:

- constant pressure
- constant differential pressure
- constant temperature
- constant differential temperature
- constant flow rate
- constant level
- constant curve
- constant other value.

MGE 15 TO 22 KW

These MTRE pumps can be set to either of these control modes:

- controlled operation
- uncontrolled operation (factory setting).

MTRE itself does not provide sensor mounting port.

In controlled-operation mode, the pump adjusts its performance to the desired setpoint. See fig. 13.

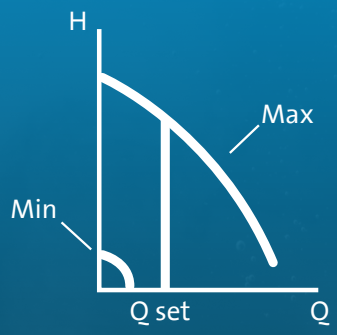


Fig. 13 Constant-flow mode

In uncontrolled-operation mode, the pump operates according to the constant curves set. See fig 14

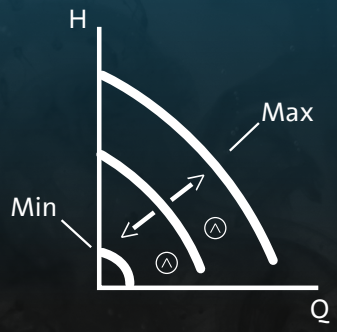
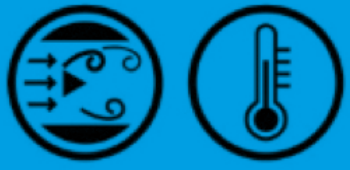


Fig. 14 Constant-curve mode

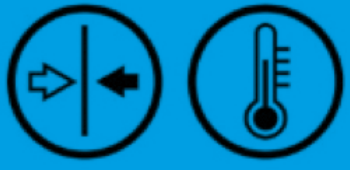
GRUNDFOS DIRECT SENSORS™

We specialize in sensors for industrial and OEM solutions. The name of Direct Sensors™ refers to having the sensor element directly immersed into and in contact with the liquid.



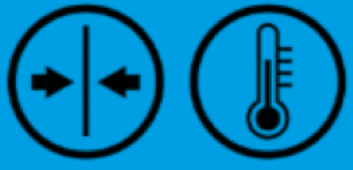
FLOW AND TEMPERATURE

Sensors for measuring Flow and Temperature in 1 product (2 in 1 principle) for standard and industrial appications.



PRESSURE AND TEMPERATURE

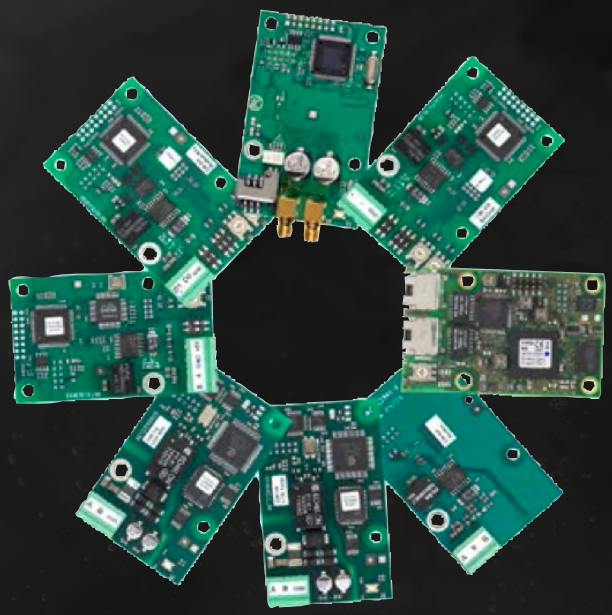
Sensor for measuring Relative Pressure and Temperature in 1 product (2 in 1 principle) for standard and industrial applications.



DIFF. PRESSURE AND TEMPERATURE

Sensor for measuring Differential Pressure and Temperature in 1 product (2 in 1 principle) for standard and industrial applications.

RECOMMENDED RANGE:
COMMUNICATION & MOTOR PROTECTION



CIM / CIU FIELDBUS COMMUNICATION INTERFACES

For complete control of pump systems, the Grundfos fieldbus concept is the right solution.
The Communication Interface Module (CIM) enable data communication via open and interoperable networks such as PROFIBUS DP, Modbus RTU, LONWorks, BACnet MS/TP, Cellular 3G/4G interfaces, Modbus TCP, PROFINET IO, BACnet IP , WITS-DNP3, EtherNet/IP or Grundfos iSolution Cloud (GiC) or Grundfos Remote Monitoring (GRM). Complete process control based on standard functional profiles.

CIM 050 For communication with GENIbus

CIM 100 For communication via LON (pumps)

CIM 150 For communication via PROFIBUS DP

CIM 200 For communication via Modbus RTU

CIM 260 * For 3G/4G cellular communication or SMS
* require a 3G/4G antenna and a related SIM card.

CIM 300 For communication via BACnet MS/TP

CIM 500 For communication via PROFINET IO/ Modbus TCP/ BACnet IP/ to Grundfos iSolution Cloud or GRM / EtherNet/IP

GRM - GRUNDFOS REMOTE MANAGMENT / GIC (GRUNDFOS ISOLUTION CLOUD)

Complete performance data available from Internet-based supervision allows optimisation of your pump or booster system.

- Receive SMS/ e-mail alarms on issues you need to act on immediately, for example low system pressure, water shortage or power supply problems
- Adjust settings remotely via Internet
- Ensure your system is correctly dimensioned to meet demand
- Analyse consumption profiles and follow energy usage

Internet-based supervision also allows you to optimise the service and maintenance program for your pump or booster system. Data from pump installations is transferred to a central database and published to subscribers on a secure web server. Users have access to data from pump installations that are registered their own account.

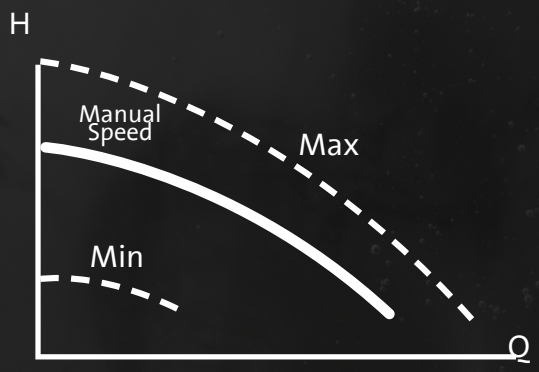
CIM 280 3G/4G cellular interface to GRM /GiC
Note: It require a 3G/4G antenna and a related 3G/4G SIM card with international SMS roaming active.

Note: GRM requires a contract with Grundfos for to hosting of data.

MANUAL OPERATION
EXAMPLE

SETTING MANUAL SPEED

Manual speed setting is only available in the advanced control panel. With Grundfos GO, you set the speed via the "Setpoint" menu. You can set the pump speed in % of the maximum speed. When you have set the operating mode to "Manual", the pump will run at the set speed.



HMI VARIANTS

BASIC (HMI100)

- Grundfos EYE
- Wireless communication

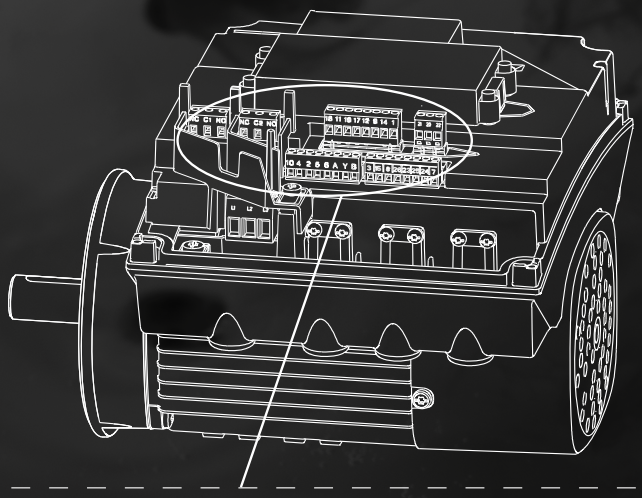
STANDARD (HMI200)

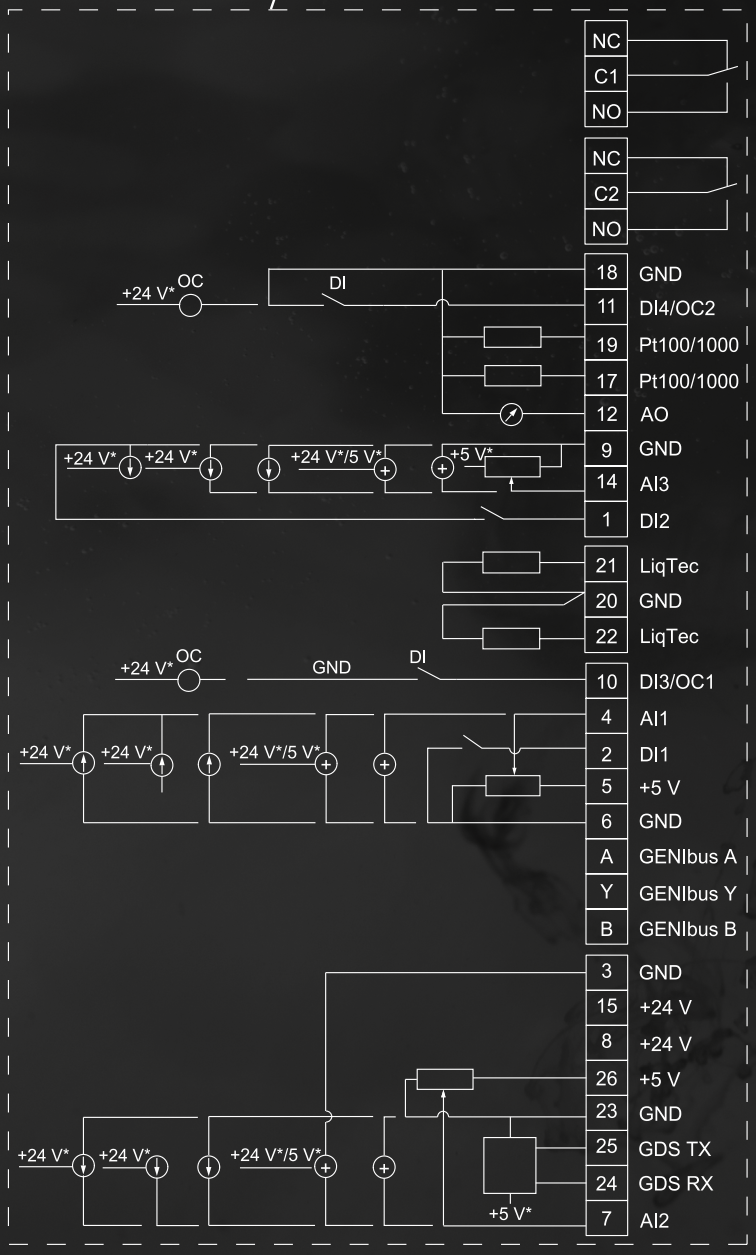
- Grundfos EYE
- Wireless communication
- Start/Stop button for local operation with Indicator light
- Setpoint indicator and adjustment

ADVANCED (HMI300)

- Grundfos EYE
- Wireless communication
- Start/Stop button for local operation with Indicator light
- Setpoint indicator and adjustment
- Full graphical monitoring and configuration

MGE CONNECTION OVERVIEW



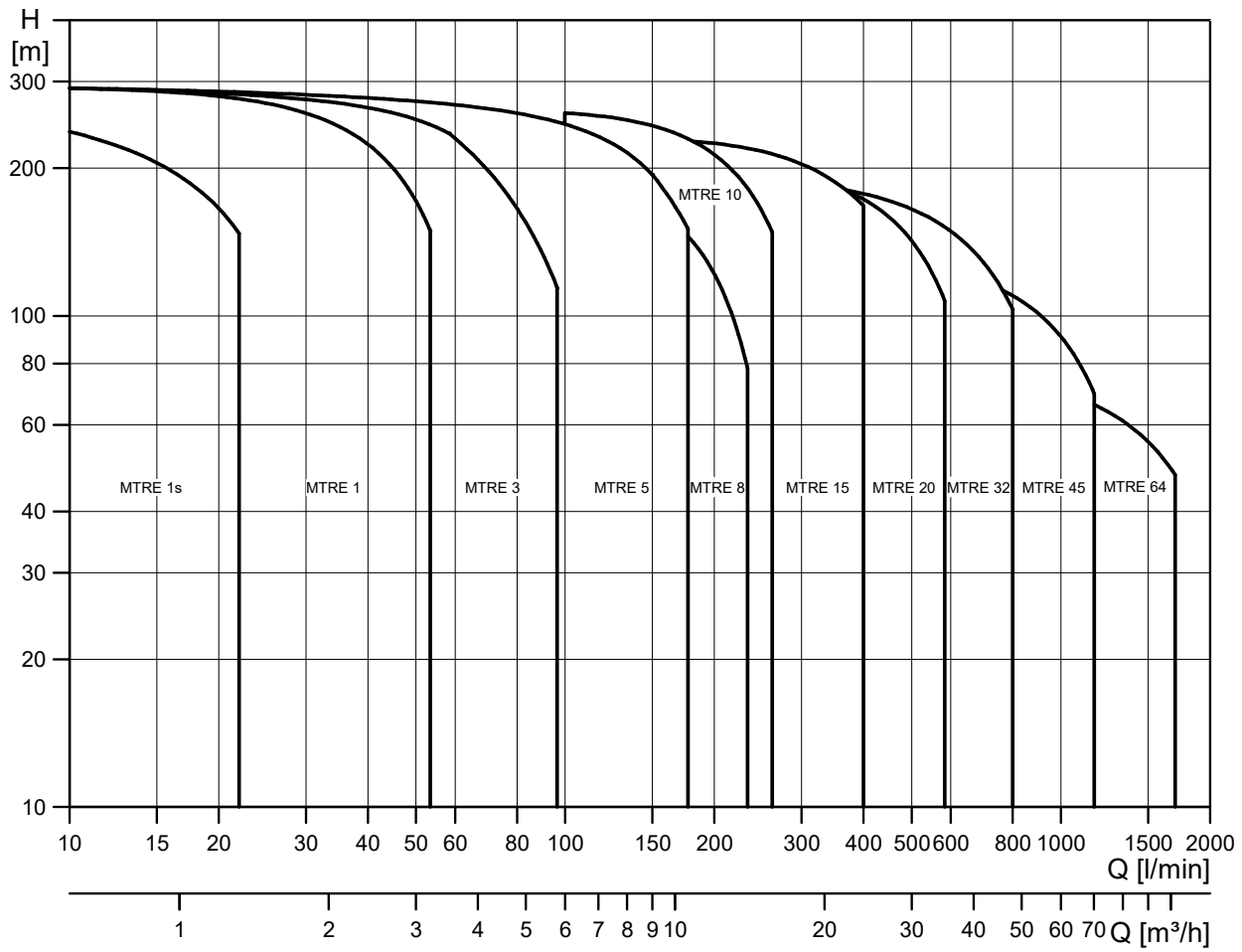


BASIC (FM100)	STANDARD (FM200)	ADVANCED (FM300)
• GENIbus	• GENIbus	• GENIbus
• CIM module support	• CIM module support	• CIM module support
• Suitable for constant curve / open loop	• Suitable for constant curve / open loop	• Suitable for constant curve / open loop
• Simple process control with constant pressure/ flow/ level/ temperature	• Demanding process control with constant pressure/ flow/ level/ temperature	• Demanding process control with constant pressure/ flow/ level/ temperature
	• Proportional pressure	• Proportional pressure
	• AUTOADAPT	• AUTOADAPT
	• FLOWADAPT	• FLOWADAPT
	• Signal relay output	• Signal relay output
	• Digital Sensor I/O	• Digital Sensor I/O
		• Pt100/1000 sensor
		• LiqTec dry-run protection
		• Real-Time Clock

(Fig. 8)

Fig. 8 Connection terminals, MTRE pumps (If you use an external supply source, there must be a connection to GND)
* If you use an external supply source, there must be a connection to GND. Fig. 8 Connection terminals, MTRE pumps.

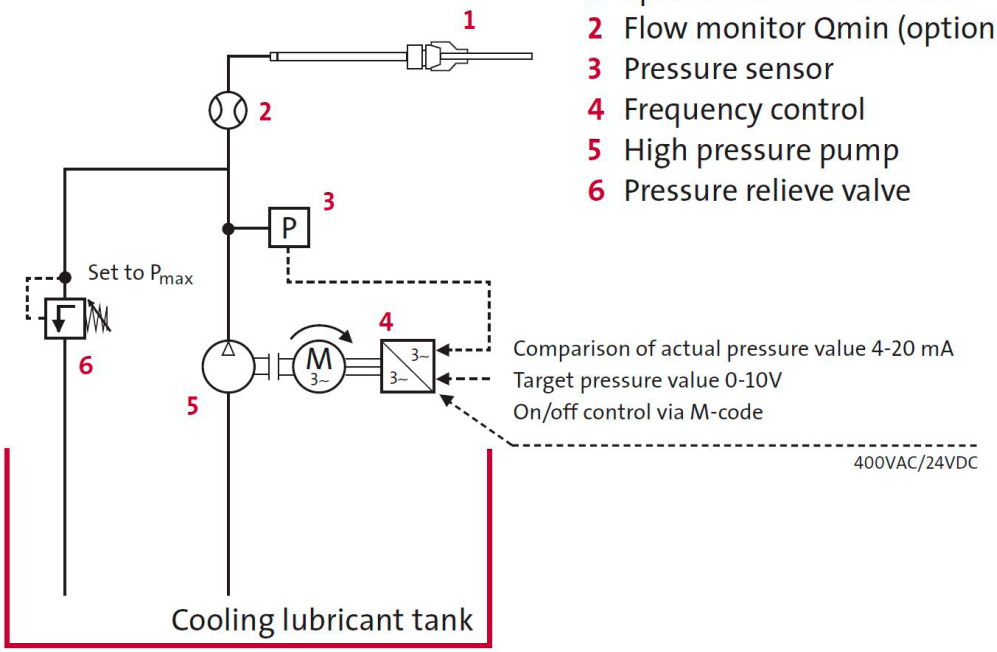
MTRE PERFORMANCE CURVE



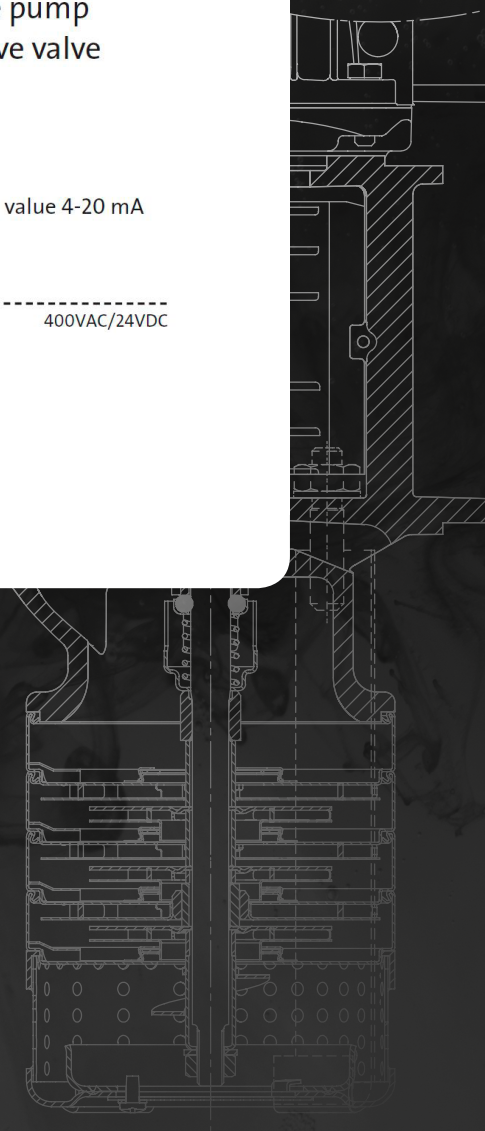
TYPICAL INSTALLATION DRAWING

INTELLIGENT APPLICATION

The E-pumps can be integrated into innovative production processes without any problem. The analogue and digital inputs permit individual control, e,g. depending on tool magazine assignment



1 Spindle and tool with IKZ
2 Flow monitor Qmin (optional)
3 Pressure sensor
4 Frequency control
5 High pressure pump
6 Pressure relieve valve



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