BACnet PICS CIM 300

Protocol Implementation Conformance Statement
for Grundfos CIM 300 BACnet MS/TP for Grundfos pumps and booster systems

Installation and operating instructions, supplement

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GRUNDFOS

Original installation and operating instructions.

CONTENTS

1. Introduction

Fig. 1 The CIM 300 BACnet MS/TP passed the BTL test in August 2014

Grundfos CIM 300 BACnet MS/TP for pumps

Document date: 22 September 2014

Vendor name: Grundfos

Product name: CIM

Product model number: 300 BACnet MS/TP

Application software: V04.02.00

Firmware revision: V04.02.00

BACnet protocol rev.: 9 (for HW R8)

2. Product description

The CIM 300 BACnet MS/TP interface from Grundfos enables BACnet communication with Grundfos pumps and systems that have a GENIbus interface. The communication interface module can either be installed directly in the Grundfos pump/system to enable BACnet MS/TP communication, or in an external power supply unit (CIU unit) connected to the pump/system. In both cases, the communication interface module is the same.

Note ***The CIM 300 BACnet MS/TP passed the BTL test in August 2014.***

BACnet Standardised Device Profile (Annex L)

❑ BACnet Operator Workstation (B-OWS)

❑ BACnet Building Controller (B-BC)

❑ BACnet Advanced Application Controller (B-AAC)

☒ BACnet Application Specific Controller (B-ASC)

❑ BACnet Smart Sensor (B-SS)

❑ BACnet Smart Actuator (B-SA)

3. Supported BACnet Interoperability Building Blocks

Data sharing services:

Name	BACnet BIBB
ReadProperty	DS-RP-B
ReadPropertyMultiple	DS-RPM-B
WriteProperty	DS-WP-B
WritePropertyMultiple	DS-WPM-B
SubscribeCOV ConfirmedCOVNotification UnconfirmedCOVNotification	DS-COV-B

Device management services:

Name	BACnet BIBB
Who-is/I-am	DM-DDB-A
	DM-DDB-B
Who-has/I-have	DM-DOB-B
DeviceCommunicationControl	DM-DCC-B

Segmentation capability

❑ Segmented requests supported

Window Size_____

❑ Segmented responses supported

Window Size_____

Note ***Segmentation is not supported.***

Object type	Supported	Dynamically creatable/ deletable
Analog input	●	-
Analog output	●	-
Analog value	●	-
Binary input	●	-
Binary output	●	-
Multistate input	●	-
Multistate output	●	-
Device	●	-

3.1 Data Link Layer options

MS/TP master (Clause 9), baud rate(s):

- 9,600 bps
- 1,9200 bps
- 38,400 bps
- 76,800 bps.

3.2 Device address binding

The device does not support static device binding, which is necessary for two-way communication with MS/TP slaves and certain other devices.

3.3 Networking options

❑ Router, Clause 6 - List all routing configurations, e.g. ARCNET-Ethernet, Ethernet-MS/TP, etc.

❑ Annex H, BACnet Tunneling Router over IP

❑ BACnet/IP Broadcast Management Device (BBMD)

Does the BBMD support registrations by foreign devices? ❑ Yes ☒ No

3.4 Character sets supported

Indicating support for multiple character sets does not imply that they can all be supported simultaneously.

Character set	Supported
ANSI X3.4	●
ISO 10646 (UCS-2)	-
ISO 10646 (UCS-4)	-
IBM™ / Microsoft™ / DBCS™	-
ISO 8859-1	-
JIS C 6226	-
UTF-8	●

3.5 Non-BACnet equipment supported

Types of non-BACnet equipment supported:

- Grundfos MAGNA circulator pumps*
- Grundfos MAGNA3 circulator pumps
- Grundfos UPE Series 2000 (UPE 80-120 and 100-120) circulator pumps
- Grundfos CRE, CRNE, CRIE, MTRE, CME (single-phase and three-phase, up to 11 kW + three-phase, 11-22 kW)
- Grundfos TPE, TPE Series 2000, NBE, NKE (single-phase and three-phase, up to 11 kW + three-phase, 11-22 kW)
- Grundfos CUE frequency converter (all versions, 0.55 - 250 kW)
- Grundfos Hydro MPC (CU 35X)* and Hydro Multi-E booster systems
- Grundfos Control MPC (CU 35X)* multipump controller
- Grundfos Hydro Multi-B (CU 323) booster system.

* Additional Grundfos GENIbus module required.

4. Complete object list

4.1 Complete object list for pumps

ID	Object Name	R/W	Notes	MAGNA/ UPE Series	E-pumps 0.25 - 7.5 kW	CUE/ E-pumps 11-22 kW
BI, 0	Control source status	R	Status of the actual control source. 0: Local control 1: Bus control.	●	●	●
BI, 1	Actual direction	R	Rotational direction of the pump impeller. 0: Clockwise 1: Counter-clockwise.	3	●	●
BI, 2	Rotation status	R	Rotation status. 0: No rotation 1: Rotation (pump running).	●	●	●
BI, 3	At minimum speed	R	0: Not running at minimum speed 1: Running at minimum speed.	●	●	●
BI, 4	At maximum speed	R	0: Not running at maximum speed 1: Running at maximum speed.	●	●	●
BI, 11	Digital input 1 status	R	0: Not active 1: Active.	3	●	●
BI, 12	Digital input 2 status	R	0: Not active 1: Active.	3	●	●
BI, 13	Digital input 3 status	R	0: Not active 1: Active.	-	●	●
BI, 14	Digital output 1 status	R	0: Not active 1: Active.	3	●	●
BI, 15	Digital output 2 status	R	0: Not active 1: Active.	3	●	●
BI, 28	Fault simulation status	R	Fault simulation status. 0: Fault simulation not active 1: Fault simulation active.	●	●	●
BI, 31	At power limit	R	0: Not running at power limit 1: Running at power limit.	3	-	-
BI, 38	Setpoint influence	R	0: Not active 1: Active.	●	-	-
BI, 39	Max. flow limit	R	0: Not active 1: Active.	3	-	-
BO, 0	Set control source	W	Sets the control source. Set to 1 to enable pump control via BACnet. 0: Local control (default) 1: Bus control.	●	●	●
BO, 1	Relay 1 control	W	Controls relay 1 if bus control is enabled and relay 1 is set to be controlled via bus. 0: Closed (default) 1: Open.	-	●	●

ID	Object Name	R/W	Notes	MAGNA/ UPE Series	E-pumps 0.25 - 7.5 kW	CUE/ E-pumps 11-22 kW
BO, 2	Relay 2 control	W	Controls relay 2 if bus control is enabled and relay 2 is set to be controlled via bus. 0: Closed (default) 1: Open.	-	-	•
BO, 4	Reset fault	W	Resets fault if bus control is enabled. (Triggered on rising edge). 0: No resetting (default) 1: Resetting.	•	•	•
BO, 5	Fault simulation	W	Enables simulated fault if bus control is enabled. 0: Disabled (default) 1: Enabled.	•	•	•
BO, 6	Copy settings to local	W	Copies remote settings to local pump settings. 0: Disabled 1: Enabled.	3	-	-
BO, 9	Enable max. flow limit	W	0: Disabled 1: Enabled.	3	-	-
MI, 0	Actual control mode	R	Reads the current control mode. 1: Constant speed 2: Constant pressure 3: Proportional pressure 4: Automatic / $AUTO_{ADAPT}$ 5: Constant flow 6: Constant temperature 7: Constant level 8: Constant percentage 9: Auto flow 10: Closed-loop sensor control.	•	•	•
MI, 1	Actual operating mode	R	Reads the current operating mode. 1: Start (normal) 2: Stop 3: Minimum 4: Maximum.	•	•	•
MI, 2	Next bearing-service type	R	Type of next bearing service. 1: Service type unknown 2: Lubricate bearings 3: Change bearings.	-	-	•
MI, 3	CIM status	R	Reads the status of the CIM module, useful for fault finding. 1: OK 2: EEPROM fault 3: Memory fault.	•	•	•

ID	Object Name	R/W	Notes	MAGNA/ UPE Series	E-pumps 0.25 - 7.5 kW	CUE/ E-pumps 11-22 kW
MI, 11	Feedback sensor unit	R	Unit of the feedback sensor. 1: Unknown 2: bar 3: mbar 4: m 5: kPa 6: psi 7: ft 8: m^3/h 9: m^3/s 10: l/s 11: gpm 12: °C 13: °F 14: % 15: K 16: W.	●	●	●
MO, 0	Set control mode	W	Sets the control mode if bus control is enabled. 1: Constant speed 2: Constant pressure 3: Proportional pressure 4: Automatic / $AUTO_{ADAPT}$ 5: Constant flow 6: Constant temperature 7: Constant level 8: Constant percentage 9: Auto flow 10: Closed-loop sensor control.	●	●	●
MO, 1	Set operating mode	W	Sets the operating mode if bus control is enabled. 1: Start (normal) 2: Stop 3: Minimum 4: Maximum.	●	●	●
AI, 0	Fault code	R	Grundfos fault code.	●	●	●
AI, 1	Warning code	R	Grundfos warning code.	3	●	●
AI, 2	Time to bearing service	R	Time to bearing service in months. A value of 24 means "24 or more".	-	-	●
AI, 3	Capacity	R	Actual capacity value (process feedback).	●	●	●
AI, 4	Head	R	Actual system head/pressure.	S	S	S
AI, 5	Flow	R	Actual system flow.	S*	S*	S*
AI, 6	Relative performance	R	Performance relative to maximum performance.	●	●	●
AI, 7	Speed	R	Motor speed.	●	●	●
AI, 8	Frequency	R	Actual control signal applied to motor.	●	●	●
AI, 9	Actual setpoint	R	Actual setpoint.	●	●	●
AI, 10	Motor current	R	Actual motor current.	3	●	●
AI, 11	DC link voltage	R	Frequency converter DC Link voltage.	●	●	●
AI, 12	Motor voltage	R	Motor voltage.	-	●	●

ID	Object Name	R/W	Notes	MAGNA/ UPE Series	E-pumps 0.25 - 7.5 kW	CUE/ E-pumps 11-22 kW
AI, 13	Power	R	Total power consumption of the pump.	●	●	●
AI, 14	Remote flow	R	Measured flow at external sensor.	3+S	G+S	S
AI, 15	Inlet pressure	R	System inlet pressure.	-	G+S	S
AI, 16	Remote pressure	R	Measured pressure at external sensor.	3+S	G+S	S
AI, 17	Level	R	Tank level.	-	S	S
AI, 18	Power electronic temperature	R	Temperature in frequency converter.	3	●	●
AI, 19	Motor temperature	R	Motor winding temperature.	-	G	●
AI, 20	Remote temperature	R	Temperature at external sensor.	-	S	S
AI, 21	Electronic temperature	R	Pump electronics temperature.	-	-	S
AI, 22	Fluid temperature	R	Pumped-liquid temperature.	●	G	S
AI, 23	Bearing temperature DE	R	Bearing temperature, drive end.	-	-	S
AI, 24	Bearing temperature NDE	R	Bearing temperature, non-drive end.	-	-	S
AI, 25	Auxiliary sensor input	R	Auxiliary sensor input.	-	S	S
AI, 26	Specific energy	R	Specific energy consumption.	3	-	CUE
AI, 27	Runtime	R	Total operating time of the pump.	●	●	●
AI, 28	Total ontime	R	Total power-on time of the pump.	●	●	●
AI, 29	Torque	R	Motor torque.	-	3-ph	●
AI, 30	Energy consumption	R	Total energy consumption of the pump.	●	●	●
AI, 31	Number of starts	R	Number of times the pump has started.	3	●	●
AI, 32	Volume	R	Total pumped volume.	3	-	CUE
AI. 37	Outlet pressure	R	System outlet pressure	-	H	-
AI, 57	Remote temperature 2	R	Temperature at external temperature sensor 2.	3+S	-	-
AI, 58	User setpoint	R	User-selected setpoint.	●	●	●
AI, 85	Minimum of feedback sensor	R	Minimum value of feedback sensor.	●	●	●
AI, 86	Maximum of feedback sensor	R	Maximum value of feedback sensor.	●	●	●
AI, 92	Load percent	R	Motor current in percent of rated motor current.	3	-	-
AI, 93	Differential pressure	R	Pressure between pump flanges.	3	-	-
AI, 95	Actual flow limit	R	Actual maximum flow limit.	3	-	-
AO, 0	Set setpoint	W	Sets the pump setpoint if bus control is enabled. A value of 0 does not imply a stop.	●	●	●
AO, 5	Set max. flow limit	W	Sets the maximum flow limit value.	3	-	-

ID	Object Name	R/W	Notes	MAGNA/ UPE Series	E-pumps 0.25 - 7.5 kW	CUE/ E-pumps 11-22 kW
AV, 0	Custom device object instance number	R/W	Value for Custom Device Object Instance Number. Used in conjunction with DIP switch SW3. Present_Value range: 0-0x3FFFFE. Default Present_Value: 0xE7.	●	●	●
AV, 1	BACnet watchdog	R/W	Time in seconds before BACnet communication watchdog times out, and sets the pump to local control mode. 0: Disabled (default). Set to a value between 5 and 3,600 to enable.	●	●	●
AV, 2	Simulation fault code	R/W	Fault code to simulate. Can be cleared by writing a value of 0.	●	●	●
AV, 3	Simulation warning code	R/W	Warning code to simulate. Can be cleared by writing a value of 0.	3	●	●
AV, 9	Product time and date	R/W	Pump time and date in UNIX format (seconds since 00:00 01-01-1970).	3	-	-

3 Only available on MAGNA3.

G Only available on model G and later versions.

● Always available.

S Sensor required.

S* On TPE Series 2000 and MAGNA/UPE, the flow is estimated and is only to be used for monitoring, not for control purposes. On all other pump types, a flow sensor is required.

CUE Only available on CUE (with sensor).

3-ph Only available on three-phase E-pumps.

4.2 Complete object list for booster systems

ID	Object Name	R/W	Notes	Units	Hydro Multi-B	Hydro MPC	Hydro Multi-E
BI, 0	Control source status	R	Status of the actual control source. 0: Local control 1: Bus control.		●	●	●
BI, 2	Rotation status	R	Rotation status. 0: No rotation 1: Rotation (one or more pumps running).		●	●	●
BI, 3	At minimum speed	R	0: Not running at minimum speed 1: Running at minimum speed.		-	●	●
BI, 4	At maximum speed	R	0: Not running at maximum speed 1: Running at maximum speed.		-	●	●
BI, 5	Standby pumps active	R	0: Standby pumps not active 1: Standby pumps active.		-	●	-
BI, 6	Pressure relief active	R	0: Pressure relief not active 1: Pressure relief active.		-	●	-
BI, 7	Soft pressure active	R	0: Soft pressure not active 1: Soft pressure active.		-	●	-
BI, 8	Low-flow boost active	R	0: Low-flow boost not active 1: Low-flow boost active.		-	●	-
BI, 9	Low-flow stop active	R	0: Low-flow stop not active 1: Low-flow stop active.		●	●	-
BI, 10	Alternative setpoint active	R	0: Alternative setpoint not active 1: Alternative setpoint active.		-	●	-
BI, 11	Digital input 1 status	R	0: Not active 1: Active.		●	●	●
BI, 12	Digital input 2 status	R	0: Not active 1: Active.		●	●	●
BI, 13	Digital input 3 status	R	0: Not active 1: Active.		●	●	●
BI, 14	Digital output 1 status	R	0: Not active 1: Active.		●	●	●
BI, 15	Digital output 2 status	R	0: Not active 1: Active.		●	●	●
BI, 16	Subpump 1 presence	R	0: Subpump not present 1: Subpump present.		●	●	●
BI, 17	Subpump 1 communication status	R	0: Communication OK 1: Communication fault.		●	●	●
BI, 18	Subpump 2 presence	R	0: Subpump not present 1: Subpump present.		●	●	●
BI, 19	Subpump 2 communication status	R	0: Communication OK 1: Communication fault.		●	●	●
BI, 20	Subpump 3 presence	R	0: Subpump not present 1: Subpump present.		●	●	●
BI, 21	Subpump 3 communication status	R	0: Communication OK 1: Communication fault.		●	●	●
BI, 22	Subpump 4 presence	R	0: Subpump not present 1: Subpump present.		●	●	●

ID	Object Name	R/W	Notes	Units	Hydro Multi-B	Hydro MPC	Hydro Multi-E
BI, 23	Subpump 4 communication status	R	0: Communication OK 1: Communication fault.		●	●	●
BI, 24	Subpump 5 presence	R	0: Subpump not present 1: Subpump present.		-	●	●
BI, 25	Subpump 5 communication status	R	0: Communication OK 1: Communication fault.		-	●	●
BI, 26	Subpump 6 presence	R	0: Subpump not present 1: Subpump present.		-	●	●
BI, 27	Subpump 6 communication status	R	0: Communication OK 1: Communication fault.		-	●	●
BI, 28	Fault simulation status	R	Fault simulation status. 0: Fault simulation disabled 1: Fault simulation enabled.		●	●	-
BI, 32	Subpump 1 auto mode	R	0: Manual control 1: Auto-control.		●	●	-
BI, 33	Subpump 2 auto mode	R	0: Manual control 1: Auto-control.		●	●	-
BI, 34	Subpump 3 auto mode	R	0: Manual control 1: Auto-control.		●	●	-
BI, 35	Subpump 4 auto mode	R	0: Manual control 1: Auto-control.		●	●	-
BI, 36	Subpump 5 auto mode	R	0: Manual control 1: Auto-control.		-	●	-
BI, 37	Subpump 6 auto mode	R	0: Manual control 1: Auto-control.		-	●	-
BI, 38	Setpoint influence active	R	0: No influence on setpoint 1: Setpoint influence active.		-	●	-
BI, 40	Pilot pump auto mode	R	0: Manual control 1: Auto-control.		-	●	-
BI, 41	Pilot pump presence	R	0: Pilot pump not present 1: Pilot pump present.		-	●	-
BI, 42	Pilot pump communication status	R	0: Communication OK 1: Communication fault.		-	●	-
BI, 43	Back-up pump auto mode	R	0: Manual control 1: Auto-control.		-	●	-
BI, 44	Back-up pump presence	R	0: Backup pump not present 1: Backup pump present.		-	●	-
BI, 45	Back-up pump communication status	R	0: Communication OK 1: Communication fault.		-	●	-
BO, 0	Set control source	W	Sets the control source. Set to 1 to enable control via BACnet. 0: Local control (default) 1: Bus control.		●	●	●

ID	Object Name	R/W	Notes	Units	Hydro Multi-B	Hydro MPC	Hydro Multi-E
BO, 4	Reset fault	W	Resets alarm if bus control is enabled. (Triggered on rising edge). 0: No resetting (default) 1: Resetting.		●	●	●
BO, 5	Fault simulation	W	Enables fault simulation. 0: Disabled (default) 1: Enabled.		●	●	-
MI, 0	Actual control mode	R	Reads the current control mode. 1: Constant speed 2: Constant pressure 3: Proportional pressure 4: RESERVED 5: Constant flow 6: Constant temperature 7: Constant level 8: Constant percentage.		●	●	●
MI, 1	Actual operating mode	R	Reads the current operating mode. 1: Start (normal) 2: Stop 3: Minimum 4: Maximum.		●	●	●
MI, 3	CIM status	R	Reads the status of the CIM module, useful for fault finding. 1: OK 2: EEPROM fault 3: Memory fault.		●	●	●
MI, 4	Subpump 1 control source	R	1: Buttons 2: GENIbus 3: GENIlink 4: External control.		●	●	-
MI, 5	Subpump 2 control source	R	1: Buttons 2: GENIbus 3: GENIlink 4: External control.		●	●	-
MI, 6	Subpump 3 control source	R	1: Buttons 2: GENIbus 3: GENIlink 4: External control.		●	●	-
MI, 7	Subpump 4 control source	R	1: Buttons 2: GENIbus 3: GENIlink 4: External control.		●	●	-
MI, 8	Subpump 5 control source	R	1: Buttons 2: GENIbus 3: GENIlink 4: External control.		-	●	-
MI, 9	Subpump 6 control source	R	1: Buttons 2: GENIbus 3: GENIlink 4: External control.		-	●	-

ID	Object Name	R/W	Notes	Units	Hydro Multi-B	Hydro MPC	Hydro Multi-E
MI, 10	Application type	R	1: Pressure boosting 2: Heating pumps on hot side 3: Heating pumps on cold side 4: AirCon pumps on hot side 5: AirCon pumps on cold side 6: MPC S2000 heating pumps on hot side 7: MPC S2000 heating pumps on cold side 8: MPC S2000 AirCon pumps on hot side 9: MPC S2000 AirCon pumps on cold side 10: Tank filling 11: Tank filling (float switches) 12: Undefined.		•	•	-
MI, 11	Feedback sensor unit	R	1: Unknown 2: bar 3: mbar 4: m 5: kPa 6: psi 7: ft 8: m^3/h 9: m^3/s 10: l/s 11: gpm 12: °C 13: °F 14: % 15: K 16: W.		•	•	-
MI, 12	Pilot pump control source		1: Buttons 2: GENIbus 3: GENIlink 4: External control.		-	•	-
MI, 13	Back-up pump control source		1: Buttons 2: GENIbus 3: GENIlink 4: External control.		-	•	-
MO, 0	Set control mode	W	Sets the control mode if bus control is enabled. 1: Constant speed 2: Constant pressure 3: Proportional pressure 4: RESERVED 5: Constant flow 6: Constant temperature 7: Constant level 8: Constant percentage. **Note:** Hydro Multi-E always runs in constant-pressure mode.		-	•	-
MO, 1	Set operating mode	W	Sets the operating mode if bus control is enabled. 1: Start (normal) 2: Stop 3: Minimum (Hydro MPC only) 4: Maximum (Hydro MPC and Hydro Multi-E only).		•	•	•

ID	Object Name	R/W	Notes	Units	Hydro Multi-B	Hydro MPC	Hydro Multi-E
MO, 2	Product simulation	W	Enables product simulation (for commissioning and testing purposes, can only be enabled when no physical booster system is present). 1: Disabled 5: Hydro Multi-E 6: Hydro MPC 7: Hydro Multi-B.		●	●	●
MO, 3	Control subpump 1	W	Manual control of subpump 1. 1: Automatic control (default) 2: Forced start (not available) 3: Forced stop.		●	●	-
MO, 4	Control subpump 2	W	Manual control of subpump 2. 1: Automatic control (default) 2: Forced start (not available) 3: Forced stop.		●	●	-
MO, 5	Control subpump 3	W	Manual control of subpump 3. 1: Automatic control (default) 2: Forced start (not available) 3: Forced stop.		●	●	-
MO, 6	Control subpump 4	W	Manual control of subpump 4. 1: Automatic control (default) 2: Forced start (not available) 3: Forced stop.		●	●	-
MO, 7	Control subpump 5	W	Manual control of subpump 5. 1: Automatic control (default) 2: Forced start (not available) 3: Forced stop.		-	●	-
MO, 8	Control subpump 6	W	Manual control of subpump 6. 1: Automatic control (default) 2: Forced start (not available) 3: Forced stop.		-	●	-
MO, 9	Control pilot pump	W	Manual control of pilot pump. 1: Automatic control (default) 2: Forced start (not available) 3: Forced stop.		-	●	-
MO, 10	Control back-up pump	W	Manual control of backup pump. 1: Automatic control (default) 2: Forced start (not available) 3: Forced stop.		-	●	-
AI, 0	Fault code	R	Grundfos fault code.	-	●	●	●
AI, 1	Warning code	R	Grundfos warning code.	-	●	●	●
AI, 3	Capacity	R	Actual capacity value (process feedback).	%	●	●	●
AI, 4	Head	R	Actual system head/pressure.	bar	-	S	S
AI, 5	Flow	R	Actual system flow.	m^3/h	-	S	S
AI, 6	Relative performance	R	Performance relative to maximum performance.	%	●	●	●
AI, 9	Actual setpoint	R	Actual setpoint.	%	●	●	●
AI, 10	Motor current	R	Actual motor current.	A	-	-	●
AI, 13	Power	R	Total power consumption of the system.	W	●	●	●
AI, 15	Inlet pressure	R	System inlet pressure.	bar	S	S	-

ID	Object Name	R/W	Notes	Units	Hydro Multi-B	Hydro MPC	Hydro Multi-E
AI, 16	Remote pressure	R	Measured pressure at external sensor.	bar	-	S	-
AI, 17	Level	R	Tank level.	m	S	S	S
AI, 20	Remote temperature	R	Temperature at external sensor.	°C	-	S	S
AI, 25	Auxiliary sensor input	R	Auxiliary sensor input.	%	S	-	S
AI, 26	Specific Energy	R	Specific energy of the system.	kWh/ m3	-	S	-
AI, 27	Runtime	R	Total operating time of the system.	h	●	●	●
AI, 30	Energy consumption	R	Total energy consumption of the system.	kWh	●	●	●
AI, 33	Ambient temperature	R	Ambient temperature.	°C	-	S	-
AI, 34	Forward temperature	R	Flow-pipe temperature.	°C	-	S	-
AI, 35	Return temperature	R	Return-pipe temperature.	°C	-	S	-
AI, 36	Differential temperature	R	Differential temperature.	°C	-	S	-
AI, 37	Outlet pressure	R	System outlet pressure.	bar	S	S	-
AI, 38	Feed tank level	R	Actual level in the feed tank.	m	-	S	-
AI, 39	Subpump1 fault code	R	Fault code, subpump 1.	-	●	●	●
AI, 40	Subpump 1 runtime	R	Total operating time, subpump 1.	h	●	●	●
AI, 41	Subpump 1 speed	R	Actual speed, subpump 1.	%	●	●	-
AI, 42	Subpump 2 fault code	R	Fault code, subpump 2.	-	●	●	●
AI, 43	Subpump 2 runtime	R	Total operating time, subpump 2.	h	●	●	●
AI, 44	Subpump 2 speed	R	Actual speed, subpump 2.	%	●	●	-
AI, 45	Subpump 3 fault code	R	Fault code, subpump 3.	-	●	●	●
AI, 46	Subpump 3 runtime	R	Total operating time, subpump 3.	h	●	●	●
AI, 47	Subpump 3 speed	R	Actual speed, subpump 3.	%	●	●	-
AI, 48	Subpump 4 fault code	R	Fault code, subpump 4.	-	●	●	●
AI, 49	Subpump 4 runtime	R	Total operating time, subpump 4.	h	●	●	●
AI, 50	Subpump 4 speed	R	Actual speed, subpump 4.	%	●	●	-
AI, 51	Subpump 5 fault code	R	Fault code, subpump 5.	-	-	●	●
AI, 52	Subpump 5 runtime	R	Total operating time, subpump 5.	h	-	●	●
AI, 53	Subpump 5 speed	R	Actual speed, subpump 5.	%	-	●	-
AI, 54	Subpump 6 fault code	R	Fault code, subpump 6.	-	-	●	●
AI, 55	Subpump 6 runtime	R	Total operating time, subpump 6.	h	-	●	●
AI, 56	Subpump 6 speed	R	Actual speed, subpump 6.	%	-	●	-
AI, 58	User setpoint	R	User-defined setpoint.	%	●	●	-

ID	Object Name	R/W	Notes	Units	Hydro Multi-B	Hydro MPC	Hydro Multi-E
AI, 59	Analogue influence	R	Analog setpoint influence.	%	●	●	-
AI, 60	Power-on counter	R	Number of power-on cycles.	-	●	●	-
AI, 61	Subpump 1	R	Line current, subpump 1.	A	●	●	-
AI, 62	Subpump 1	R	Power consumption, subpump 1.	W	●	●	-
AI, 63	Subpump 1	R	Motor temperature, subpump 1.	C	●	●	-
AI, 64	Subpump 1	R	Number of starts, subpump 1.	-	●	●	-
AI, 65	Subpump 2	R	Line current, subpump 2.	A	●	●	-
AI, 66	Subpump 2	R	Power consumption, subpump 2.	W	●	●	-
AI, 67	Subpump 2	R	Motor temperature, subpump 2.	C	●	●	-
AI, 68	Subpump 2	R	Number of starts, subpump 2.	-	●	●	-
AI, 69	Subpump 3	R	Line current, subpump 3.	A	●	●	-
AI, 70	Subpump 3	R	Power consumption, subpump 3.	W	●	●	-
AI, 71	Subpump 3	R	Motor temperature, subpump 3.	C	●	●	-
AI, 72	Subpump 3	R	Number of starts, subpump 3.	-	●	●	-
AI, 73	Subpump 4	R	Line current, subpump 4.	A	●	●	-
AI, 74	Subpump 4	R	Power consumption, subpump 4.	W	●	●	-
AI, 75	Subpump 4	R	Motor temperature, subpump 4.	C	●	●	-
AI, 76	Subpump 4	R	Number of starts, subpump 4.	-	●	●	-
AI, 77	Subpump 5	R	Line current, subpump 5.	A	-	●	-
AI, 78	Subpump 5	R	Power consumption, subpump 5.	W	-	●	-
AI, 79	Subpump 5	R	Motor temperature, subpump 5.	C	-	●	-
AI, 80	Subpump 5	R	Number of starts, subpump 5.	-	-	●	-
AI, 81	Subpump 6	R	Line current, subpump 6.	A	-	●	-
AI, 82	Subpump 6	R	Power consumption, subpump 6.	W	-	●	-
AI, 83	Subpump 6	R	Motor temperature, subpump 6.	C	-	●	-
AI, 84	Subpump 6	R	Number of starts, subpump 6.	-	-	●	-
AI, 85	Minimum of feedback sensor	R	Minimum of feedback sensor.	(see MI, 11 for unit)	-	●	●
AI, 86	Maximum of feedback sensor	R	Maximum of feedback sensor.	(see MI, 11 for unit)	-	●	●
AI, 87	Actual tank-filling tank height	R	Tank height in tank-filling mode.	m	●	-	-
AI, 88	Actual tank-filling start limit	R	Start limit in percent of tank height.	%	●	-	-
AI, 89	Actual tank-filling stop limit	R	Stop limit in percent of tank height.	%	●	-	-
AI, 90	Actual tank-filling alarm high-limit	R	Alarm high-limit in percent of tank height.	%	●	-	-
AI, 91	Actual tank-filling warning low-limit	R	Warning low-limit in percent of tank height.	%	●	-	-
AI, 96	Specific energy average	R	Average specific energy.	kWh/ m3	-	S	-
AI, 97	Flow measurement 1	R	Flow measurement 1.	m^3/h	-	S	-

ID	Object Name	R/W	Notes	Units	Hydro Multi-B	Hydro MPC	Hydro Multi-E
AI, 98	Flow measurement 2	R	Flow measurement 2.	m^3/h	-	S	-
AI, 99	Flow measurement 3	R	Flow measurement 3.	m^3/h	-	S	-
AI, 100	Pilot pump fault code	R	Fault code, pilot pump.	-	-	●	-
AI, 101	Pilot pump runtime	R	Total operating time, pilot pump.	h	-	●	-
AI, 102	Pilot pump speed	R	Actual speed, pilot pump.	%	-	●	-
AI, 103	Pilot pump line current	R	Line current, pilot pump.	A	-	●	-
AI, 104	Pilot pump power consumption	R	Power consumption, pilot pump.	W	-	●	-
AI, 105	Pilot pump motor temperature	R	Motor temperature, pilot pump.	C	-	●	-
AI, 106	Pilot pump number of starts	R	Number of starts, pilot pump.	-	-	●	-
AI, 107	Back-up pump fault code	R	Fault code, backup pump.	-	-	●	-
AI, 108	Back-up pump runtime	R	Total operating time, backup pump.	h	-	●	-
AI, 109	Back-up pump speed	R	Actual speed, backup pump.	%	-	●	-
AI, 110	Back-up pump line current	R	Line current, backup pump.	A	-	●	-
AI, 111	Back-up pump power consumption	R	Power consumption, backup pump.	W	-	●	-
AI, 112	Back-up pump motor temperature	R	Motor temperature, backup pump.	C	-	●	-
AI, 113	Back-up pump number of starts	R	Number of starts, backup pump.	-	-	●	-
AI, 122	Subpump 1	R	Energy consumption	kWh	-	●	-
AI, 123	Subpump 2	R	Energy consumption	kWh	-	●	-
AI, 124	Subpump 3	R	Energy consumption	kWh	-	●	-
AI, 125	Subpump 4	R	Energy consumption	kWh	-	●	-
AI, 126	Subpump 5	R	Energy consumption	kWh	-	●	-
AI, 127	Subpump 6	R	Energy consumption	kWh	-	●	-
AI, 128	Pilot pump	R	Energy consumption	kWh	-	●	-
AI, 129	Backup pump	R	Energy consumption	kWh	-	●	-
AO, 0	Set setpoint	W	Sets the booster system setpoint if bus control is enabled. A value of 0 does not imply a stop.	%	●	●	●

ID	Object Name	R/W	Notes	Units	Hydro Multi-B	Hydro MPC	Hydro Multi-E
AO, 1	Tank-filling start limit	W	Sets the start limit in percent of tank height.	%	●	-	-
AO, 2	Tank-filling stop limit	W	Sets the stop limit in percent of tank height.	%	●	-	-
AO, 3	Tank-filling alarm high-limit	W	Sets the alarm high-limit in percent of tank height.	%	●	-	-
AO, 4	Tank-filling warning low-limit	W	Sets the warning low-limit in percent of tank height.	%	●	-	-
AV, 0	Custom device object instance number	R/W	Value for Custom Device Object Instance Number. Used in conjunction with DIP switch SW3. Present_Value range: 0-0x3FFFFE. Default Present_Value: 0xE7.		●	●	●
AV, 1	BACnet watchdog	R/W	Time in seconds before BACnet communication watchdog times out, and sets the booster system to use its local settings. 0: Disabled (default). Set to a value between 5 and 3600 to enable.		●	●	●
AV, 4	Simulation event code	R/W	Event code to simulate. The following event code values are available for simulation of CU 35X (among others): 000: No alarm 003: External fault 010: Booster system communication alarm 089: Closed-loop feedback sensor signal fault 088: General (measuring) sensor signal fault 203: All pumps in alarm 210: Pressure high 211: Pressure low 214: Water shortage 231: No Ethernet address from DHCP server.		●	●	-
AV, 5	Simulation device type	R/W	Device type of simulated event. 0: Controller 2: Pump 3: IO 351 4: Primary sensor 7: IO 351 8: System 9: Analog input 10: Pilot booster system 11: Limit-exceeded function.		●	●	-
AV, 6	Simulation device number	R/W	Device number of simulated event. If the device type is "Pump", the device number indicates the pump number [1-6]. If the device type is "Analog input", the device number indicates the sensor that generated the event [1-7].		●	●	-

ID	Object Name	R/W	Notes	Units	Hydro Multi-B	Hydro MPC	Hydro Multi-E
AV, 7	Simulation event action type	R/W	The associated action to the event. 0: Go to operating mode "Stop". 1: Go to operating mode "Stop" (delay). 2: Go to operating mode "Minimum". 3: Go to operating mode "User-defined". 4: Go to operating mode "Maximum". 5: Set pumps in source mode to "Local control". 6: No action (warning only). 7: Go to operating mode "Emergency run".		-	●	-
AV, 8	Simulation event reset type	R/W	Resetting type for simulated event. Manual or automatic. 0: Manual resetting 1: Automatic resetting.		-	●	-
AV, 10	Proportional-control reduction	R/W	Reduction in % to be used in proportional-pressure control mode.		-	●	-
AV. 11	Proportional-control flow max.	R/W	Max. flow in m^3/h to be used in proportional-pressure control mode.		-	●	-

Subject to alterations.

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