TA-Smart: Register selection help

TA-Smart is a 2-way communicating control and balancing valve with measurement capabilities. Data can be communicated via Modbus RTU, Modbus TCP, BACnet MS/TP or BACnet IP.

This document **helps you deciding which registers can typically be collected to understand your hydronic circuit. This is an example for <u>Modbus RTU</u>.** The same logic can be used for the other protocols.

For more details, please refer to the exhaustive list of registers available online.
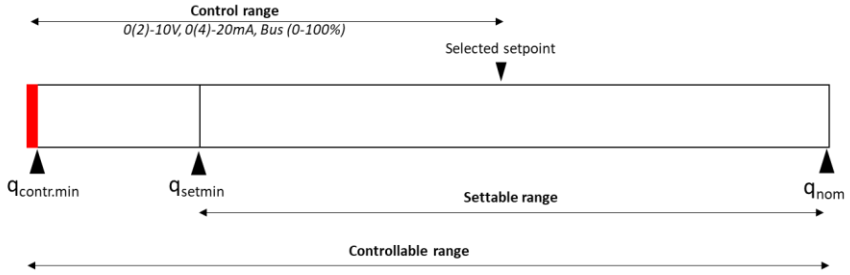
<u>Structure:</u>

TA-Smart: Register selection help

0- Introduction

q_{nom} – Maximum flow that can be set to TA-Smart
q_{setmin} – Minimum flow that can be set to a given TA-Smart
$q_{contr.min}$ – Minimum flow that can be controlled by TA-Smart

Selected setpoint – The value you want to represent full flow through the valve
Control range – The flow range the valve will control
Controllable range – The potential flow range the valve can control
Settable range – The range between the maximum and minimum setpoint of the valve
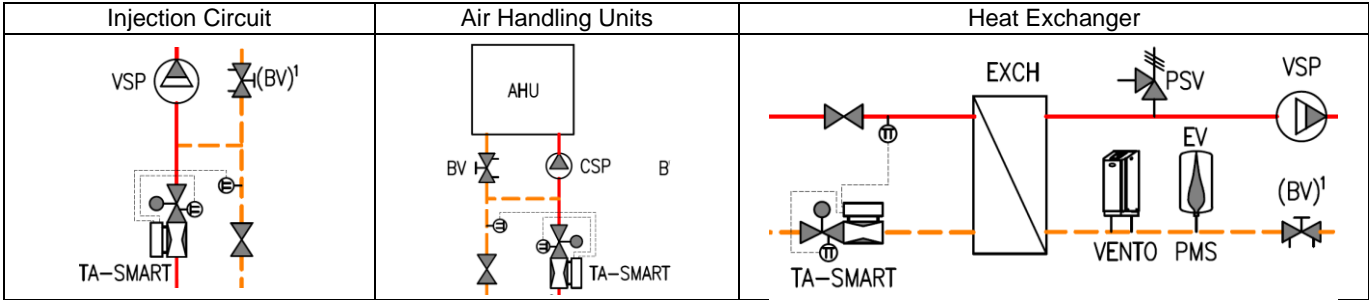

All units are parametrizable using the below registers.

Register	Address	Data type	Access	Unit	Value range	Default	Description
FlowUnit1	128	Word	R/W	n.a.	0: m3/h 1: l/s 2: l/min 3: l/h 4: GPM	0	First selected flow unit
FlowUnit2	129	Word	R/W	n.a.	0: m3/h 1: l/s 2: l/min 3: l/h 4: GPM	4	Second selected flow unit
PowerUnit1	130	Word	R/W	n.a.	0: kW 1: W 2: Btu/h 3: kBtu/h 4: ton (refrig.)	0	First selected power unit
PowerUnit2	131	Word	R/W	n.a.	0: kW 1: W 2: Btu/h 3: kBtu/h 4: ton (refrig.)	3	Second selected power unit
EnergyUnit1	132	Word	R/W	n.a.	0: kWh 1: kJ 2: MJ 3: kBtu 4: MBtu 5: ton.h	0	First selected energy unit
EnergyUnit2	133	Word	R/W	n.a.	0: kWh 1: kJ 2: MJ 3: kBtu 4: MBtu 5: ton.h	4	Second selected energy unit
DpUnit1	134	Word	R/W	n.a.	0: kPa 1: bar 2: psi	1	First selected differential pressure unit
DpUnit2	135	Word	R/W	n.a.	0: kPa 1: bar 2: psi	4	Second selected differential pressure unit

TA-Smart: Register selection help

1- Heating OR cooling: Flow control

TA-Smart flow control (ensure ControlMode:122 value is 1) can be done via:

- the bus, use the register "RelativeSetPoint: 302-303" to write the value
- an analog signal, use the register "AnalogSetPointValue 300-301" to read the value (this is the hybrid mode)
  It is advised to use an _EQM characteristic_ (default value)

Injection Circuit	Air Handling Units	Heat Exchanger

						Valve configuration		Controlling	
						Maintenance/Troubelshooting		Measuring Hydronic parameters	
Register	Address	Data type	Access	Unit	Value range		Default	Description	
ValveSize	2	Word	R	n.a.	3: DN20 - 3/4" 4: DN25 - 1" 5: DN32 - 1"1/4 6: DN40 - 1"1/2 7: DN50 - 2" 8: DN65 - 2"1/2 9: DN80 - 3" 10: DN100 - 4" 11: DN125 - 5"		n.a.	Size of the valve	
ValveUserID	102-117	String	R/W	n.a.	n.a.		n.a.	Editable alphanumeric chain (32 chars) that can be used to label the valve	
ControlMode	122	Word	R/W	n.a.	**1: Flow control** 2: Power control 3: Dp control 4: Position control		1	The control mode indicates which variable is being controlled by the valve	
ControlSource	126	Word	R/W	n.a.	0: Analog 1: Bus		0	Control source specifies whether the setpoint for controlling the valve is provided by the analog input (in which case bus is used just for monitoring) or by the bus	
MaxFlowRegime1_unit1	206-207	Float	R/W	FlowUnit1	[ValveMinAdjustableFlow_unit1, ValveNominalFlow_unit1]		ValveNom	Max flow assigned to the valve when the valve is in regime 1	
MinFlowRegime1_unit1	214-215	Float	R/W	FlowUnit1	[0.0, MaxFlowRegime1_unit1]		0.0	Min flow assigned to the valve when the valve is in regime 1	
AnalogSetPointValue	300-301	Float	R	VDC or mA	[0.0, 10.0] for VDC; [0.0, 20.0] for mA		n.a.	Analog input value in VDC or mA used as setpoint for controlling the valve if register ControlSource is set to Analog. Value is VDC or mA depending on register AnalogSignalType	
RelativeSetpoint	302-303	Float	R/W	%	[0.0, 100.0]		100.0	Relative setpoint in percentage of currently applicable max value. This setpoint applies if register ControlSource is set to Bus	
OverrideType	400	Word	R/W	n.a.	0: None 1: Flow 2: Power 3: Dp 4: Valve position 5: Stop 6: Simulated operation		0	Type of override defining which action is taken as an override to the configured control. The valve resets automatically to normal operation leaving the override after 3 hours.	
OverrideValue_unit1	401-402	Float	R/W		[0.0, 3.4e+38]			Value of the max flow, power or position that applies if register OverrideType is set to 1, 2, 4 or 6. The value is expressed according in selected Unit1 for flow and power and in mm for position	
FlowSetPoint_unit1	304-305	Float	R	FlowUnit1	[0.0, ValveNominalFlow_unit1]		n.a.	Flow setpoint	
MeasuredFlow_unit1	318-319	Float	R	FlowUnit1	[0.0, 3.4e+38]		n.a.	Measured flow	
MeasuredSupplyTemp_degC	322-323	Float	R	°C	[-40.0, 140.0]		n.a.	Measured supply temperature	
MeasuredReturnTemp_degC	326-327	Float	R	°C	[-40.0, 140.0]		n.a.	Measured return temperature	
MeasuredDeltaT_K	330-331	Float	R	K	[0.0, 3.4e+38]		n.a.	Measured Delta T	
MeasuredPower_unit1	336-337	Float	R	PowerUnit1	[0.0, 3.4e+38]		n.a.	Measured power	
EnergyCounterRegime1_unit1	340-341	Float	R	EnergyUnit1	[0.0, 3.4e+38]		n.a.	Energy counter in regime 1	
RelativeMeasuredPosition	348-349	Float	R	%	[0.0, 100.0]		n.a.	Measured position expressed in percentage of the currently applicable maximum position depending on register CurrentRegime	
CurrentErrorState	500-501	Long	R	n.a.	Bit 0 (0x01): 0/1		0	Error 1: ErrorLowPower	
					Bit 1 (0x02): 0/1		0	Error 2: ErrorInputLineBroken	
					Bit 2 (0x04): 0/1		0	Error 3: WarningFlowNotReached	
					Bit 3 (0x08): 0/1		0	Error 4: WarningPowerNotReached	
					Bit 4 (0x10): 0/1		0	Error 5: ErrorLocalTempSensorDisconnected	
					Bit 5 (0x20): 0/1		0	Error 6: ErrorRemoteTempSensorDisconnected	
					Bit 6 (0x40): 0/1		0	Error 7: ErrorLocalTempSensorShortCircuit	
					Bit 7 (0x80): 0/1		0	Error 8: ErrorRemoteTempSensorShortCircuit	
					Bit 8 (0x100): 0/1		0	Error 9: ErrorLocalTempSensorBelowMin	
					Bit 9 (0x200): 0/1		0	Error 10: ErrorRemoteTempSensorBelowMin	
					Bit 10 (0x400): 0/1		0	Error 11: ErrorLocalTempSensorAboveMax	
					Bit 11 (0x800): 0/1		0	Error 12: ErrorRemoteTempSensorAboveMax	
					Bit 12 (0x1000): 0/1		0	Error 13: WarningActuatorManualOverride	
					Bit 13 (0x2000): 0/1		0	Error 14: ErrorActuatorBlocked	
					Bit 14 (0x4000): 0/1		0	Error 15: ErrorFlowMeasurement	
					Bit 16 (0x10000): 0/1		0	Error 17: Reverse Flow Detected	
					Bit 17 (0x20000): 0/1		0	Error 18: ErrorActuatorComFailure	

2- Heating OR cooling: Power control

TA-Smart power control (ensure ControlMode:122 value is 2) can be done via:

- the bus, use the register "RelativeSetPoint: 302-303" to write/read the value
- an analog signal, use the register "AnalogSetPointValue 300-301" to read the value (this is the hybrid mode)

It is advised to use a _linear characteristic_

Register	Address	Data type	Access	Unit	Value range	Default	Description
							Valve configuration
							Maintenance/Troubelshooting
							Controlling
							Measuring Hydronic parameters
ValveSize	2	Word	R	n.a.	3: DN20 - 3/4" 4: DN25 - 1" 5: DN32 - 1"1/4 6: DN40 - 1"1/2 7: DN50 - 2" 8: DN65 - 2"1/2 9: DN80 - 3" 10: DN100 - 4" 11: DN125 - 5"	n.a.	Size of the valve
ValveUserID	102-117	String	R/W	n.a.	n.a.	n.a.	Editable alphanumeric chain (32 chars) that can be used to label the valve
ControlMode	122	Word	R/W	n.a.	1: Flow control 2: Power control 3: Dp control 4: Position control	1	The control mode indicates which variable is being controlled by the valve
ControlSource	126	Word	R/W	n.a.	0: Analog 1: Bus	0	Control source specifies whether the setpoint for controlling the valve is provided by the analog input (in which case bus is used just for monitoring) or by the bus
MaxFlowRegime1_unit1	206-207	Float	R/W	FlowUnit1	[ValveMinAdjustableFlow_unit1, ValveNominalFlow_unit1]	ValveNominalFlow_unit1	Max flow assigned to the valve when the valve is in regime 1
MaxPowerRegime1_unit1	222-223	Float	R/W	PowerUnit1	[ValveMinAdjustablePower_unit1, ValveNominalPower_unit1]	ValveNominalPower_unit1	Max power assigned to the valve when the valve is in regime 1
AnalogSetPointValue	300-301	Float	R	VDC or mA	[0.0, 10.0] for VDC; [0.0, 20.0] for mA	n.a.	Analog input value in VDC or mA used as setpoint for controlling the valve if register ControlSource is set to Analog. Value is VDC or mA depending on register AnalogSignalType
RelativeSetpoint	302-303	Float	R/W	%	[0.0, 100.0]	100.0	Relative setpoint in percentage of currently applicable max value. This setpoint applies if register ControlSource is set to Bus
OverrideType	400	Word	R/W	n.a.	0: None 1: Flow 2: Power 3: Dp 4: Valve position 5: Stop 6: Simulated operation	0	Type of override defining which action is taken as an override to the configured control. The valve resets automatically to normal operation leaving the override after 3 hours.
OverrideValue_unit1	401-402	Float	R/W		[0.0, 3.4e+38]		Value of the max flow, power or position that applies if register OverrideType is set to 1, 2, 4 or 6. The value is expressed according in selected Unit1 for flow and power and in mm for position
PowerSetPoint_unit1	308-309	Float	R	PowerUnit1	[0.0, ValveNominalPower_unit1]	n.a.	Power setpoint
MeasuredFlow_unit1	318-319	Float	R	FlowUnit1	[0.0, 3.4e+38]	n.a.	Measured flow
MeasuredSupplyTemp_degC	322-323	Float	R	°C	[-40.0, 140.0]	n.a.	Measured supply temperature
MeasuredReturnTemp_degC	326-327	Float	R	°C	[-40.0, 140.0]	n.a.	Measured return temperature
MeasuredDeltaT_K	330-331	Float	R	K	[0.0, 3.4e+38]	n.a.	Measured Delta T
MeasuredPower_unit1	336-337	Float	R	PowerUnit1	[0.0, 3.4e+38]	n.a.	Measured power
EnergyCounterRegime1_unit1	340-341	Float	R	EnergyUnit1	[0.0, 3.4e+38]	n.a.	Energy counter in regime 1
RelativeMeasuredPosition	348-349	Float	R	%	[0.0, 100.0]	n.a.	Measured position expressed in percentage of the currently applicable maximum position depending on register CurrentRegime
CurrentErrorState	500-501	Long	R	n.a.	Bit 0 (0x01): 0/1	0	Error 1: ErrorLowPower
					Bit 1 (0x02): 0/1	0	Error 2: ErrorInputLineBroken
					Bit 2 (0x04): 0/1	0	Error 3: WarningFlowNotReached
					Bit 3 (0x08): 0/1	0	Error 4: WarningPowerNotReached
					Bit 4 (0x10): 0/1	0	Error 5: ErrorLocalTempSensorDisconnected
					Bit 5 (0x20): 0/1	0	Error 6: ErrorRemoteTempSensorDisconnected
					Bit 6 (0x40): 0/1	0	Error 7: ErrorLocalTempSensorShortCircuit
					Bit 7 (0x80): 0/1	0	Error 8: ErrorRemoteTempSensorShortCircuit
					Bit 8 (0x100): 0/1	0	Error 9: ErrorLocalTempSensorBelowMin
					Bit 9 (0x200): 0/1	0	Error 10: ErrorRemoteTempSensorBelowMin
					Bit 10 (0x400): 0/1	0	Error 11: ErrorLocalTempSensorAboveMax
					Bit 11 (0x800): 0/1	0	Error 12: ErrorRemoteTempSensorAboveMax
					Bit 12 (0x1000): 0/1	0	Error 13: WarningActuatorManualOverride
					Bit 13 (0x2000): 0/1	0	Error 14: ErrorActuatorBlocked
					Bit 14 (0x4000): 0/1	0	Error 15: ErrorFlowMeasurement
					Bit 16 (0x10000): 0/1	0	Error 17: Reverse Flow Detected
					Bit 17 (0x20000): 0/1	0	Error 18: ErrorActuatorComFailure

TA-Smart: Register selection help

3- Heating OR cooling: Dp control

TA-Smart Dp control (ensure ControlMode:122 value is 3) is done via the Dp sensors values.
The user can define the differential pressure to be stabilised using DpStabSetpointRegime1_unit1:372-373
It is advised to use a _linear characteristic._

Register	Address	Data type	Access	Unit	Value range	Default	Description
	Valve configuration					Controlling	
	Maintenance/Troubelshooting					Measuring Hydronic parameters	
ValveSize	2	Word	R	n.a.	3: DN20 - 3/4" 4: DN25 - 1" 5: DN32 - 1"1/4 6: DN40 - 1"1/2 7: DN50 - 2" 8: DN65 - 2"1/2 9: DN80 - 3" 10: DN100 - 4" 11: DN125 - 5"	n.a.	Size of the valve
ValveUserID	102-117	String	R/W	n.a.	n.a.	n.a.	Editable alphanumeric chain (32 chars) that can be used to label the valve
ControlMode	122	Word	R/W	n.a.	1: Flow control 2: Power control 3: Dp control 4: Position control	1	The control mode indicates which variable is being controlled by the valve
ControlSource	126	Word	R/W	n.a.	0: Analog 1: Bus	0	Control source specifies whether the setpoint for controlling the valve is provided by the analog input (in which case bus is used just for monitoring) or by the bus
MaxFlowRegime1_unit1	206-207	Float	R/W	FlowUnit1	[ValveMinAdjustableFlow_unit1, ValveNominalFlow_unit1]	ValveNominalFlow_unit1	Max flow assigned to the valve when the valve is in regime 1
DpStabSetpointRegime1_unit1	372-373	Float	R/W	DpUnit1	[MinAdjustableDpStab_unit1, MaxAdjustableDpStab_unit1]	MinAdjustableDpStab_unit1	Stabilised differential pressure setpoint assigned to the valve when the valve is in regime 1
OverrideType	400	Word	R/W	n.a.	0: None 1: Flow 2: Power 3: Dp 4: Valve position 5: Stop 6: Simulated operation	0	Type of override defining which action is taken as an override to the configured control. The valve resets automatically to normal operation leaving the override after 3 hours.
OverrideValue_unit1	401-402	Float	R/W		[0.0, 3.4e+38]		Value of the max flow, power or position that applies if register OverrideType is set to 1, 2, 4 or 6. The value is expressed according in selected Unit1 for flow and power and in mm for position
MeasuredDpStab_unit1	380-381	Float	R	DpUnit1	[0.0, 3.4e+38]	n.a.	
FlowSetPoint_unit1	304-305	Float	R	FlowUnit1	[0.0, ValveNominalFlow_unit1]	n.a.	Flow setpoint
MeasuredFlow_unit1	318-319	Float	R	FlowUnit1	[0.0, 3.4e+38]	n.a.	Measured flow
MeasuredSupplyTemp_degC	322-323	Float	R	°C	[-40.0, 140.0]	n.a.	Measured supply temperature
MeasuredReturnTemp_degC	326-327	Float	R	°C	[-40.0, 140.0]	n.a.	Measured return temperature
MeasuredDeltaT_K	330-331	Float	R	K	[0.0, 3.4e+38]	n.a.	Measured Delta T
MeasuredPower_unit1	336-337	Float	R	PowerUnit1	[0.0, 3.4e+38]	n.a.	Measured power
EnergyCounterRegime1_unit1	340-341	Float	R	EnergyUnit1	[0.0, 3.4e+38]	n.a.	Energy counter in regime 1
RelativeMeasuredPosition	348-349	Float	R	%	[0.0, 100.0]	n.a.	Measured position expressed in percentage of the currently applicable maximum position depending on register CurrentRegime
CurrentErrorState	500-501	Long	R	n.a.	Bit 0 (0x01): 0/1	0	Error 1: ErrorLowPower
					Bit 1 (0x02): 0/1	0	Error 2: ErrorInputLineBroken
					Bit 2 (0x04): 0/1	0	Error 3: WarningFlowNotReached
					Bit 3 (0x08): 0/1	0	Error 4: WarningPowerNotReached
					Bit 4 (0x10): 0/1	0	Error 5: ErrorLocalTempSensorDisconnected
					Bit 5 (0x20): 0/1	0	Error 6: ErrorRemoteTempSensorDisconnected
					Bit 6 (0x40): 0/1	0	Error 7: ErrorLocalTempSensorShortCircuit
					Bit 7 (0x80): 0/1	0	Error 8: ErrorRemoteTempSensorShortCircuit
					Bit 8 (0x100): 0/1	0	Error 9: ErrorLocalTempSensorBelowMin
					Bit 9 (0x200): 0/1	0	Error 10: ErrorRemoteTempSensorBelowMin
					Bit 10 (0x400): 0/1	0	Error 11: ErrorLocalTempSensorAboveMax
					Bit 11 (0x800): 0/1	0	Error 12: ErrorRemoteTempSensorAboveMax
					Bit 12 (0x1000): 0/1	0	Error 13: WarningActuatorManualOverride
					Bit 13 (0x2000): 0/1	0	Error 14: ErrorActuatorBlocked
					Bit 14 (0x4000): 0/1	0	Error 15: ErrorFlowMeasurement
					Bit 16 (0x10000): 0/1	0	Error 17: Reverse Flow Detected
					Bit 17 (0x20000): 0/1	0	Error 18: ErrorActuatorComFailure
					Bit 18 (0x40000): 0/1	0	Error 19: ErrorDpSensorDisconnected
					Bit 19 (0x80000): 0/1	0	Error 20: WarningAvailDpTooLowForDpStab
					Bit 20 (0x100000): 0/1	0	Error 21: WarningResistLoadTooLowForDpStab
					Bit 21 (0x200000): 0/1	0	Error 22: WarningDpStabAboveMax

4- CHANGE OVER – Flow control mode

TA-Smart flow control (ensure ControlMode:122 value is 1) can be done via:

- the bus, use the register "RelativeSetPoint: 302-303" to write the value
- an analog signal, use the register "AnalogSetPointValue 300-301" to read the value

It is advised to use an _EQM characteristic_ (default value)

Register	Address	Data type	Access	Unit	Value range	Default	Description
				Valve configuration		Controlling	
				Maintenance/Troubelshooting		Measuring Hydronic parameters	
ValveSize	2	Word	R	n.a.	3: DN20 - 3/4" 4: DN25 - 1" 5: DN32 - 1"1/4 6: DN40 - 1"1/2 7: DN50 - 2" 8: DN65 - 2"1/2 9: DN80 - 3" 10: DN100 - 4" 11: DN125 - 5"	n.a.	Size of the valve
ValveUserID	102-117	String	R/W	n.a.	n.a.	n.a.	Editable alphanumeric chain (32 chars) that can be used to label the valve
ControlMode	122	Word	R/W	n.a.	1: Flow control 2: Power control 3: Dp control 4: Position control	1	The control mode indicates which variable is being controlled by the valve
ControlSource	126	Word	R/W	n.a.	0: Analog 1: Bus	0	Control source specifies whether the setpoint for controlling the valve is provided by the analog input (in which case bus is used just for monitoring) or by the bus
CurrentRegime	201	Word	R/W	n.a.	0: Regime1 1: Regime2 2: Regime1Setback 3: Regime2Setback	0	Current change-over regime. Changing the current change-over regime via Modbus can be done only if register RegimeSwitching is set to 2.
R1SetbackPercentage	202-203	Float	R/W	%	[0.0, 100.0]	80.0	Setback percentage applied to MaxFlowRegime1 when CurrentRegime is set to Regime1Setback
R2SetbackPercentage	204-205	Float	R/W	%	[0.0, 100.0]	80.0	Setback percentage applied to MaxFlowRegime2 when CurrentRegime is set to Regime2Setback
MaxFlowRegime1_unit1	206-207	Float	R/W	FlowUnit1	[ValveMinAdjustableFlow_unit1, ValveNominalFlow_unit1]	ValveNominalFlow_unit1	Max flow assigned to the valve when the valve is in regime 1
MaxFlowRegime2_unit1	210-211	Float	R/W	FlowUnit1	[ValveMinAdjustableFlow_unit1, ValveNominalFlow_unit1]	ValveNominalFlow_unit1	Max flow assigned to the valve when the valve is in regime 2
MinFlowRegime1_unit1	214-215	Float	R/W	FlowUnit1	[0.0, MaxFlowRegime1_unit1]	0.0	Min flow assigned to the valve when the valve is in regime 1
MinFlowRegime2_unit1	218-219	Float	R/W	FlowUnit1	[0.0, MaxFlowRegime2_unit1]	0.0	Min flow assigned to the valve when the valve is in regime 2
AnalogSetPointValue	300-301	Float	R	VDC or mA	[0.0, 10.0] for VDC; [0.0, 20.0] for mA	n.a.	Analog input value in VDC or mA used as setpoint for controlling the valve if register ControlSource is set to Analog. Value is VDC or mA depending on register AnalogSignalType
RelativeSetpoint	302-303	Float	R/W	%	[0.0, 100.0]	100.0	Relative setpoint in percentage of currently applicable max value. This setpoint applies if register ControlSource is set to Bus
OverrideType	400	Word	R/W	n.a.	0: None 1: Flow 2: Power 3: Dp 4: Valve position 5: Stop 6: Simulated operation	0	Type of override defining which action is taken as an override to the configured control. The valve resets automatically to normal operation leaving the override after 3 hours.
OverrideValue_unit1	401-402	Float	R/W		[0.0, 3.4e+38]		Value of the max flow, power or position that applies if register OverrideType is set to 1, 2, 4 or 6. The value is expressed according in selected Unit1 for flow and power and in mm for position
FlowSetPoint_unit1	304-305	Float	R	FlowUnit1	[0.0, ValveNominalFlow_unit1]	n.a.	Flow setpoint
MeasuredFlow_unit1	318-319	Float	R	FlowUnit1	[0.0, 3.4e+38]	n.a.	Measured flow
MeasuredSupplyTemp_degC	322-323	Float	R	°C	[-40.0, 140.0]	n.a.	Measured supply temperature
MeasuredReturnTemp_degC	326-327	Float	R	°C	[-40.0, 140.0]	n.a.	Measured return temperature
MeasuredDeltaT_K	330-331	Float	R	K	[0.0, 3.4e+38]	n.a.	Measured Delta T
MeasuredPower_unit1	336-337	Float	R	PowerUnit1	[0.0, 3.4e+38]	n.a.	Measured power
EnergyCounterRegime1_unit1	340-341	Float	R	EnergyUnit1	[0.0, 3.4e+38]	n.a.	Energy counter in regime 1
EnergyCounterRegime2_unit1	344-345	Float	R	EnergyUnit1	[0.0, 3.4e+38]	n.a.	Energy counter in regime 2
RelativeMeasuredPosition	348-349	Float	R	%	[0.0, 100.0]	n.a.	Measured position expressed in percentage of the currently applicable maximum position depending on register CurrentRegime
CurrentErrorState	500-501	Long	R	n.a.	Bit 0 (0x01): 0/1	0	Error 1: ErrorLowPower
					Bit 1 (0x02): 0/1	0	Error 2: ErrorInputLineBroken
					Bit 2 (0x04): 0/1	0	Error 3: WarningFlowNotReached
					Bit 3 (0x08): 0/1	0	Error 4: WarningPowerNotReached
					Bit 4 (0x10): 0/1	0	Error 5: ErrorLocalTempSensorDisconnected
					Bit 5 (0x20): 0/1	0	Error 6: ErrorRemoteTempSensorDisconnected
					Bit 6 (0x40): 0/1	0	Error 7: ErrorLocalTempSensorShortCircuit
					Bit 7 (0x80): 0/1	0	Error 8: ErrorRemoteTempSensorShortCircuit
					Bit 8 (0x100): 0/1	0	Error 9: ErrorLocalTempSensorBelowMin
					Bit 9 (0x200): 0/1	0	Error 10: ErrorRemoteTempSensorBelowMin
					Bit 10 (0x400): 0/1	0	Error 11: ErrorLocalTempSensorAboveMax
					Bit 11 (0x800): 0/1	0	Error 12: ErrorRemoteTempSensorAboveMax
					Bit 12 (0x1000): 0/1	0	Error 13: WarningActuatorManualOverride
					Bit 13 (0x2000): 0/1	0	Error 14: ErrorActuatorBlocked
					Bit 14 (0x4000): 0/1	0	Error 15: ErrorFlowMeasurement
					Bit 16 (0x10000): 0/1	0	Error 17: Reverse Flow Detected
					Bit 17 (0x20000): 0/1	0	Error 18: ErrorActuatorComFailure

5- CHANGE OVER – Power control mode

TA-Smart power control (ensure ControlMode:122 value is 2) can be done via:

- the bus, use the register "RelativeSetPoint: 302-303" to write the value
- an analog signal, use the register "AnalogSetPointValue 300-301" to read the value

It is advised to use a *linear characteristic*

Register	Address	Data type	Access	Unit	Value range	Default	Description
	Valve configuration					Controlling	
	Maintenance/Troubelshooting					Measuring Hydronic parameters	
ValveSize	2	Word	R	n.a.	3: DN20 - 3/4" 4: DN25 - 1" 5: DN32 - 1"1/4 6: DN40 - 1"1/2 7: DN50 - 2" 8: DN65 - 2"1/2 9: DN80 - 3" 10: DN100 - 4" 11: DN125 - 5"	n.a.	Size of the valve
ValveUserID	102-117	String	R/W	n.a.	n.a.	n.a.	Editable alphanumeric chain (32 chars) that can be used to label the valve
ControlMode	122	Word	R/W	n.a.	1: Flow control 2: Power control 3: Dp control 4: Position control	1	The control mode indicates which variable is being controlled by the valve
ControlSource	126	Word	R/W	n.a.	0: Analog 1: Bus	0	Control source specifies whether the setpoint for controlling the valve is provided by the analog input (in which case bus is used just for monitoring) or by the bus
CurrentRegime	201	Word	R/W	n.a.	0: Regime1 1: Regime2 2: Regime1Setback 3: Regime2Setback	0	Current change-over regime. Changing the current change-over regime via Modbus can be done only if register RegimeSwitching is set to 2.
R1SetbackPercentage	202-203	Float	R/W	%	[0.0, 100.0]	80.0	Setback percentage applied to MaxFlowRegime1 when CurrentRegime is set to Regime1Setback
R2SetbackPercentage	204-205	Float	R/W	%	[0.0, 100.0]	80.0	Setback percentage applied to MaxFlowRegime2 when CurrentRegime is set to Regime2Setback
MaxFlowRegime1_unit1	206-207	Float	R/W	FlowUnit1	[ValveMinAdjustableFlow_unit1, ValveNominalFlow_unit1]	ValveNominalFlow_unit1	Max flow assigned to the valve when the valve is in regime 1
MaxFlowRegime2_unit1	210-211	Float	R/W	FlowUnit1	[ValveMinAdjustableFlow_unit1, ValveNominalFlow_unit1]	ValveNominalFlow_unit1	Max flow assigned to the valve when the valve is in regime 2
MaxPowerRegime1_unit1	222-223	Float	R/W	PowerUnit1	[ValveMinAdjustablePower_unit1, ValveNominalPower_unit1]	ValveNominalPower_unit1	Max power assigned to the valve when the valve is in regime 1
MaxPowerRegime2_unit1	226-227	Float	R/W	PowerUnit1	[ValveMinAdjustablePower_unit1, ValveNominalPower_unit1]	ValveNominalPower_unit1	Max power assigned to the valve when the valve is in regime 2
AnalogSetPointValue	300-301	Float	R	VDC or mA	[0.0, 10.0] for VDC; [0.0, 20.0] for mA	n.a.	Analog input value in VDC or mA used as setpoint for controlling the valve if register ControlSource is set to Analog. Value is VDC or mA depending on register AnalogSignalType
RelativeSetpoint	302-303	Float	R/W	%	[0.0, 100.0]	100.0	Relative setpoint in percentage of currently applicable max value. This setpoint applies if register ControlSource is set to Bus
OverrideType	400	Word	R/W	n.a.	0: None 1: Flow 2: Power 3: Dp 4: Valve position 5: Stop 6: Simulated operation	0	Type of override defining which action is taken as an override to the configured control. The valve resets automatically to normal operation leaving the override after 3 hours.
OverrideValue_unit1	401-402	Float	R/W		[0.0, 3.4e+38]		Value of the max flow, power or position that applies if register OverrideType is set to 1, 2, 4 or 6. The value is expressed according in selected Unit1 for flow and power and in mm for position
PowerSetPoint_unit1	308-309	Float	R	PowerUnit1	[0.0, ValveNominalPower_unit1]	n.a.	Power setpoint
MeasuredFlow_unit1	318-319	Float	R	FlowUnit1	[0.0, 3.4e+38]	n.a.	Measured flow
MeasuredSupplyTemp_degC	322-323	Float	R	°C	[-40.0, 140.0]	n.a.	Measured supply temperature
MeasuredReturnTemp_degC	326-327	Float	R	°C	[-40.0, 140.0]	n.a.	Measured return temperature
MeasuredDeltaT_K	330-331	Float	R	K	[0.0, 3.4e+38]	n.a.	Measured Delta T
MeasuredPower_unit1	336-337	Float	R	PowerUnit1	[0.0, 3.4e+38]	n.a.	Measured power
EnergyCounterRegime1_unit1	340-341	Float	R	EnergyUnit1	[0.0, 3.4e+38]	n.a.	Energy counter in regime 1
EnergyCounterRegime2_unit1	344-345	Float	R	EnergyUnit1	[0.0, 3.4e+38]	n.a.	Energy counter in regime 2
RelativeMeasuredPosition	348-349	Float	R	%	[0.0, 100.0]	n.a.	Measured position expressed in percentage of the currently applicable maximum position depending on register CurrentRegime
CurrentErrorState	500-501	Long	R	n.a.	Bit 0 (0x01): 0/1	0	Error 1: ErrorLowPower
					Bit 1 (0x02): 0/1	0	Error 2: ErrorInputLineBroken
					Bit 2 (0x04): 0/1	0	Error 3: WarningFlowNotReached
					Bit 3 (0x08): 0/1	0	Error 4: WarningPowerNotReached
					Bit 4 (0x10): 0/1	0	Error 5: ErrorLocalTempSensorDisconnected
					Bit 5 (0x20): 0/1	0	Error 6: ErrorRemoteTempSensorDisconnected
					Bit 6 (0x40): 0/1	0	Error 7: ErrorLocalTempSensorShortCircuit
					Bit 7 (0x80): 0/1	0	Error 8: ErrorRemoteTempSensorShortCircuit
					Bit 8 (0x100): 0/1	0	Error 9: ErrorLocalTempSensorBelowMin
					Bit 9 (0x200): 0/1	0	Error 10: ErrorRemoteTempSensorBelowMin
					Bit 10 (0x400): 0/1	0	Error 11: ErrorLocalTempSensorAboveMax
					Bit 11 (0x800): 0/1	0	Error 12: ErrorRemoteTempSensorAboveMax
					Bit 12 (0x1000): 0/1	0	Error 13: WarningActuatorManualOverride
					Bit 13 (0x2000): 0/1	0	Error 14: ErrorActuatorBlocked
					Bit 14 (0x4000): 0/1	0	Error 15: ErrorFlowMeasurement
					Bit 16 (0x10000): 0/1	0	Error 17: Reverse Flow Detected
					Bit 17 (0x20000): 0/1	0	Error 18: ErrorActuatorComFailure

6- CHANGE OVER – Dp control mode

TA-Smart Dp control (ensure ControlMode:122 value is 3) is done via the Dp sensors values.
It is advised to use a _linear characteristic_

Register	Address	Data type	Access	Unit	Value range	Default	Description
					Valve configuration	Controlling	
					Maintenance/Troubelshooting	Measuring Hydronic parameters	
ValveSize	2	Word	R	n.a.	3: DN20 - 3/4" 4: DN25 - 1" 5: DN32 - 1"1/4 6: DN40 - 1"1/2 7: DN50 - 2" 8: DN65 - 2"1/2 9: DN80 - 3" 10: DN100 - 4" 11: DN125 - 5"	n.a.	Size of the valve
ValveUserID	102-117	String	R/W	n.a.	n.a.	n.a.	Editable alphanumeric chain (32 chars) that can be used to label the valve
ControlMode	122	Word	R/W	n.a.	1: Flow control 2: Power control 3: Dp control 4: Position control	1	The control mode indicates which variable is being controlled by the valve
ControlSource	126	Word	R/W	n.a.	0: Analog 1: Bus	0	Control source specifies whether the setpoint for controlling the valve is provided by the analog input (in which case bus is used just for monitoring) or by the bus
CurrentRegime	201	Word	R/W	n.a.	0: Regime1 1: Regime2 2: Regime1Setback 3: Regime2Setback	0	Current change-over regime. Changing the current change-over regime via Modbus can be done only if register RegimeSwitching is set to 2.
R1SetbackPercentage	202-203	Float	R/W	%	[0.0, 100.0]	80.0	Setback percentage applied to MaxFlowRegime1 when CurrentRegime is set to Regime1Setback
R2SetbackPercentage	204-205	Float	R/W	%	[0.0, 100.0]	80.0	Setback percentage applied to MaxFlowRegime2 when CurrentRegime is set to Regime2Setback
MaxFlowRegime1_unit1	206-207	Float	R/W	FlowUnit1	[ValveMinAdjustableFlow_unit1, ValveNominalFlow_unit1]	ValveNominalFlow_unit1	Max flow assigned to the valve when the valve is in regime 1
DpStabSetpointRegime1_unit1	372-373	Float	R/W	DpUnit1	[MinAdjustableDpStab_unit1, MaxAdjustableDpStab_unit1]	MinAdjustableDpStab_unit1	Stabilised differential pressure setpoint assigned to the valve when the valve is in regime 1
DpStabSetpointRegime2_unit1	376-377	Float	R/W	DpUnit1	[MinAdjustableDpStab_unit1, MaxAdjustableDpStab_unit1]	MinAdjustableDpStab_unit1	Stabilised differential pressure setpoint assigned to the valve when the valve is in regime 2
OverrideType	400	Word	R/W	n.a.	0: None 1: Flow 2: Power 3: Dp 4: Valve position 5: Stop 6: Simulated operation	0	Type of override defining which action is taken as an override to the configured control. The valve resets automatically to normal operation leaving the override after 3 hours.
OverrideValue_unit1	401-402	Float	R/W		[0.0, 3.4e+38]		Value of the max flow, power or position that applies if register OverrideType is set to 1, 2, 4 or 6. The value is expressed according in selected Unit1 for flow and power and in mm for position
MeasuredDpStab_unit1	380-381	Float	R	DpUnit1	[0.0, 3.4e+38]	n.a.	
FlowSetPoint_unit1	304-305	Float	R	FlowUnit1	[0.0, ValveNominalFlow_unit1]	n.a.	Flow setpoint
MeasuredFlow_unit1	318-319	Float	R	FlowUnit1	[0.0, 3.4e+38]	n.a.	Measured flow
MeasuredSupplyTemp_degC	322-323	Float	R	°C	[-40.0, 140.0]	n.a.	Measured supply temperature
MeasuredReturnTemp_degC	326-327	Float	R	°C	[-40.0, 140.0]	n.a.	Measured return temperature
MeasuredDeltaT_K	330-331	Float	R	K	[0.0, 3.4e+38]	n.a.	Measured Delta T
MeasuredPower_unit1	336-337	Float	R	PowerUnit1	[0.0, 3.4e+38]	n.a.	Measured power
EnergyCounterRegime1_unit1	340-341	Float	R	EnergyUnit1	[0.0, 3.4e+38]	n.a.	Energy counter in regime 1
EnergyCounterRegime2_unit1	344-345	Float	R	EnergyUnit1	[0.0, 3.4e+38]	n.a.	Energy counter in regime 2
RelativeMeasuredPosition	348-349	Float	R	%	[0.0, 100.0]	n.a.	Measured position expressed in percentage of the currently applicable maximum position depending on register CurrentRegime
CurrentErrorState	500-501	Long	R	n.a.	Bit 0 (0x01): 0/1	0	Error 1: ErrorLowPower
					Bit 1 (0x02): 0/1	0	Error 2: ErrorInputLineBroken
					Bit 2 (0x04): 0/1	0	Error 3: WarningFlowNotReached
					Bit 3 (0x08): 0/1	0	Error 4: WarningPowerNotReached
					Bit 4 (0x10): 0/1	0	Error 5: ErrorLocalTempSensorDisconnected
					Bit 5 (0x20): 0/1	0	Error 6: ErrorRemoteTempSensorDisconnected
					Bit 6 (0x40): 0/1	0	Error 7: ErrorLocalTempSensorShortCircuit
					Bit 7 (0x80): 0/1	0	Error 8: ErrorRemoteTempSensorShortCircuit
					Bit 8 (0x100): 0/1	0	Error 9: ErrorLocalTempSensorBelowMin
					Bit 9 (0x200): 0/1	0	Error 10: ErrorRemoteTempSensorBelowMin
					Bit 10 (0x400): 0/1	0	Error 11: ErrorLocalTempSensorAboveMax
					Bit 11 (0x800): 0/1	0	Error 12: ErrorRemoteTempSensorAboveMax
					Bit 12 (0x1000): 0/1	0	Error 13: WarningActuatorManualOverride
					Bit 13 (0x2000): 0/1	0	Error 14: ErrorActuatorBlocked
					Bit 14 (0x4000): 0/1	0	Error 15: ErrorFlowMeasurement
					Bit 16 (0x10000): 0/1	0	Error 17: Reverse Flow Detected
					Bit 17 (0x20000): 0/1	0	Error 18: ErrorActuatorComFailure
					Bit 18 (0x40000): 0/1	0	Error 19: ErrorDpSensorDisconnected
					Bit 19 (0x80000): 0/1	0	Error 20: WarningAvailDpTooLowForDpStab
					Bit 20 (0x100000): 0/1	0	Error 21: WarningResistLoadTooLowForDpStab
					Bit 21 (0x200000): 0/1	0	Error 22: WarningDpStabAboveMax

7- TEMPERATURE LIMITATION – Flow control mode

TA-Smart power control (ensure ControlMode:122 value is 1) can be done via:

- the bus, use the register "RelativeSetPoint: 302-303" to write the value
- an analog signal, use the register "AnalogSetPointValue 300-301" to read the value
- the temperature limitation is working on top of the flow control mode

It is advised to use a _EQM characteristic_

Register	Address	Data type	Access	Unit	Value range	Default	Description
		Valve configuration				Controlling	
		Maintenance/Troubelshooting				Measuring Hydronic parameters	
ValveSize	2	Word	R	n.a.	3: DN20 - 3/4" 4: DN25 - 1" 5: DN32 - 1"1/4 6: DN40 - 1"1/2 7: DN50 - 2" 8: DN65 - 2"1/2 9: DN80 - 3" 10: DN100 - 4" 11: DN125 - 5"	n.a.	Size of the valve
ValveUserID	102-117	String	R/W	n.a.	n.a.	n.a.	Editable alphanumeric chain (32 chars) that can be used to label the valve
ControlMode	122	Word	R/W	n.a.	**1: Flow control** 2: Power control 3: Dp control 4: Position control	1	The control mode indicates which variable is being controlled by the valve
ControlSource	126	Word	R/W	n.a.	0: Analog 1: Bus	0	Control source specifies whether the setpoint for controlling the valve is provided by the analog input (in which case bus is used just for monitoring) or by the bus
MaxFlowRegime1_unit1	206-207	Float	R/W	FlowUnit1	[ValveMinAdjustableFlow_unit 1, ValveNominalFlow_unit1]	ValveNom	Max flow assigned to the valve when the valve is in regime 1
MinFlowRegime1_unit1	214-215	Float	R/W	FlowUnit1	[0.0, MaxFlowRegime1_unit1]	0.0	Min flow assigned to the valve when the valve is in regime 1
TemperatureLimitationType	246	Word	R/W	n.a.	0: None 1: DT limitation 2: T return limitation	0	Temperature limitation type to be chosen between DT or return temperature. It applies on top of the currently operating control mode provided that the flow is above a defined threshold.
TemperatureLimitationStatus	247	Word	R	n.a.	0: Inactive 1: Active	0	Current status of the temperature limitation. There are conditions under which an enabled temp limitation is inactive (e.g. when the setpoint of the control source is below the temperature limitation target)
DeltaTSetpointRegime1_deg K	356-357	Float	R/W	K	[1.0, 50.0]	6.0	Delta temperature setpoint assigned to the valve when the valve is in regime 1
TReturnSetpointRegime1_de gC	364-365	Float	R/W	°C	[-9.0, 119.0]	12.0	Return temperature setpoint assigned to the valve when the valve is in regime 1
AnalogSetPointValue	300-301	Float	R	VDC or mA	[0.0, 10.0] for VDC; [0.0, 20.0] for mA	n.a.	Analog input value in VDC or mA used as setpoint for controlling the valve if register ControlSource is set to Analog. Value is VDC or mA depending on register AnalogSignalType
RelativeSetpoint	302-303	Float	R/W	%	[0.0, 100.0]	100.0	Relative setpoint in percentage of currently applicable max value. This setpoint applies if register ControlSource is set to Bus
OverrideType	400	Word	R/W	n.a.	0: None 1: Flow 2: Power 3: Dp 4: Valve position 5: Stop 6: Simulated operation	0	Type of override defining which action is taken as an override to the configured control. The valve resets automatically to normal operation leaving the override after 3 hours.
OverrideValue_unit1	401-402	Float	R/W		[0.0, 3.4e+38]		Value of the max flow, power or position that applies if register OverrideType is set to 1, 2, 4 or 6. The value is expressed according in selected Unit1 for flow and power and in mm for position
FlowSetPoint_unit1	304-305	Float	R	FlowUnit1	[0.0, ValveNominalFlow_unit1]	n.a.	Flow setpoint
MeasuredFlow_unit1	318-319	Float	R	FlowUnit1	[0.0, 3.4e+38]	n.a.	Measured flow
MeasuredSupplyTemp_degC	322-323	Float	R	°C	[-40.0, 140.0]	n.a.	Measured supply temperature
MeasuredReturnTemp_degC	326-327	Float	R	°C	[-40.0, 140.0]	n.a.	Measured return temperature
MeasuredDeltaT_K	330-331	Float	R	K	[0.0, 3.4e+38]	n.a.	Measured Delta T
MeasuredPower_unit1	336-337	Float	R	PowerUnit1	[0.0, 3.4e+38]	n.a.	Measured power
EnergyCounterRegime1_unit 1	340-341	Float	R	EnergyUnit1	[0.0, 3.4e+38]	n.a.	Energy counter in regime 1
RelativeMeasuredPosition	348-349	Float	R	%	[0.0, 100.0]	n.a.	Measured position expressed in percentage of the currently applicable maximum position depending on register CurrentRegime
CurrentErrorState	500-501	Long	R	n.a.	Bit 0 (0x01): 0/1	0	Error 1: ErrorLowPower
					Bit 1 (0x02): 0/1	0	Error 2: ErrorInputLineBroken
					Bit 2 (0x04): 0/1	0	Error 3: WarningFlowNotReached
					Bit 3 (0x08): 0/1	0	Error 4: WarningPowerNotReached
					Bit 4 (0x10): 0/1	0	Error 5: ErrorLocalTempSensorDisconnected
					Bit 5 (0x20): 0/1	0	Error 6: ErrorRemoteTempSensorDisconnected
					Bit 6 (0x40): 0/1	0	Error 7: ErrorLocalTempSensorShortCircuit
					Bit 7 (0x80): 0/1	0	Error 8: ErrorRemoteTempSensorShortCircuit
					Bit 8 (0x100): 0/1	0	Error 9: ErrorLocalTempSensorBelowMin
					Bit 9 (0x200): 0/1	0	Error 10: ErrorRemoteTempSensorBelowMin
					Bit 10 (0x400): 0/1	0	Error 11: ErrorLocalTempSensorAboveMax
					Bit 11 (0x800): 0/1	0	Error 12: ErrorRemoteTempSensorAboveMax
					Bit 12 (0x1000): 0/1	0	Error 13: WarningActuatorManualOverride
					Bit 13 (0x2000): 0/1	0	Error 14: ErrorActuatorBlocked
					Bit 14 (0x4000): 0/1	0	Error 15: ErrorFlowMeasurement
					Bit 16 (0x10000): 0/1	0	Error 17: Reverse Flow Detected
					Bit 17 (0x20000): 0/1	0	Error 18: ErrorActuatorComFailure

8- TEMPERATURE LIMITATION – Power control mode

TA-Smart power control (ensure ControlMode:122 value is 2) can be done via:

- the bus, use the register "RelativeSetPoint: 302-303" to write the value
- an analog signal, use the register "AnalogSetPointValue 300-301" to read the value
- the temperature limitation is working on top of the power control mode

It is advised to use a *linear characteristic*

Register	Address	Data type	Access	Unit	Value range	Default	Description
		Valve configuration				Controlling	
		Maintenance/Troubelshooting				Measuring Hydronic parameters	
ValveSize	2	Word	R	n.a.	3: DN20 - 3/4" 4: DN25 - 1" 5: DN32 - 1"1/4 6: DN40 - 1"1/2 7: DN50 - 2" 8: DN65 - 2"1/2 9: DN80 - 3" 10: DN100 - 4" 11: DN125 - 5"	n.a.	Size of the valve
ValveUserID	102-117	String	R/W	n.a.	n.a.	n.a.	Editable alphanumeric chain (32 chars) that can be used to label the valve
ControlMode	122	Word	R/W	n.a.	1: Flow control 2: Power control 3: Dp control 4: Position control	1	The control mode indicates which variable is being controlled by the valve
ControlSource	126	Word	R/W	n.a.	0: Analog 1: Bus	0	Control source specifies whether the setpoint for controlling the valve is provided by the analog input (in which case bus is used just for monitoring) or by the bus
MaxFlowRegime1_unit1	206-207	Float	R/W	FlowUnit1	[ValveMinAdjustableFlow_unit1, ValveNominalFlow_unit1]	ValveNominalFlow_unit1	Max flow assigned to the valve when the valve is in regime 1
MaxPowerRegime1_unit1	222-223	Float	R/W	PowerUnit1	[ValveMinAdjustablePower_unit1, ValveNominalPower_unit1]	ValveNominalPower_unit1	Max power assigned to the valve when the valve is in regime 1
TemperatureLimitationType	246	Word	R/W	n.a.	0: None 1: DT limitation 2: T return limitation	0	Temperature limitation type to be chosen between DT or return temperature. It applies on top of the currently operating control mode provided that the flow is above a defined threshold.
TemperatureLimitationStatus	247	Word	R	n.a.	0: Inactive 1: Active	0	Current status of the temperature limitation. There are conditions under which an enabled temp limitation is inactive (e.g. when the setpoint of the control source is below the temperature limitation target)
DeltaTSetpointRegime1_degK	356-357	Float	R/W	K	[1.0, 50.0]	6.0	Delta temperature setpoint assigned to the valve when the valve is in regime 1
TReturnSetpointRegime1_degC	364-365	Float	R/W	°C	[-9.0, 119.0]	12.0	Return temperature setpoint assigned to the valve when the valve is in regime 1
AnalogSetPointValue	300-301	Float	R	VDC or mA	[0.0, 10.0] for VDC; [0.0, 20.0] for mA	n.a.	Analog input value in VDC or mA used as setpoint for controlling the valve if register ControlSource is set to Analog. Value is VDC or mA depending on register AnalogSignalType
RelativeSetpoint	302-303	Float	R/W	%	[0.0, 100.0]	100.0	Relative setpoint in percentage of currently applicable max value. This setpoint applies if register ControlSource is set to Bus
OverrideType	400	Word	R/W	n.a.	0: None 1: Flow 2: Power 3: Dp 4: Valve position 5: Stop 6: Simulated operation	0	Type of override defining which action is taken as an override to the configured control. The valve resets automatically to normal operation leaving the override after 3 hours.
OverrideValue_unit1	401-402	Float	R/W		[0.0, 3.4e+38]		Value of the max flow, power or position that applies if register OverrideType is set to 1, 2, 4 or 6. The value is expressed according in selected Unit1 for flow and power and in mm for position
PowerSetPoint_unit1	308-309	Float	R	PowerUnit1	[0.0, ValveNominalPower_unit1]	n.a.	Power setpoint
MeasuredFlow_unit1	318-319	Float	R	FlowUnit1	[0.0, 3.4e+38]	n.a.	Measured flow
MeasuredSupplyTemp_degC	322-323	Float	R	°C	[-40.0, 140.0]	n.a.	Measured supply temperature
MeasuredReturnTemp_degC	326-327	Float	R	°C	[-40.0, 140.0]	n.a.	Measured return temperature
MeasuredDeltaT_K	330-331	Float	R	K	[0.0, 3.4e+38]	n.a.	Measured Delta T
MeasuredPower_unit1	336-337	Float	R	PowerUnit1	[0.0, 3.4e+38]	n.a.	Measured power
EnergyCounterRegime1_unit1	340-341	Float	R	EnergyUnit1	[0.0, 3.4e+38]	n.a.	Energy counter in regime 1
RelativeMeasuredPosition	348-349	Float	R	%	[0.0, 100.0]	n.a.	Measured position expressed in percentage of the currently applicable maximum position depending on register CurrentRegime
CurrentErrorState	500-501	Long	R	n.a.	Bit 0 (0x01): 0/1	0	Error 1: ErrorLowPower
					Bit 1 (0x02): 0/1	0	Error 2: ErrorInputLineBroken
					Bit 2 (0x04): 0/1	0	Error 3: WarningFlowNotReached
					Bit 3 (0x08): 0/1	0	Error 4: WarningPowerNotReached
					Bit 4 (0x10): 0/1	0	Error 5: ErrorLocalTempSensorDisconnected
					Bit 5 (0x20): 0/1	0	Error 6: ErrorRemoteTempSensorDisconnected
					Bit 6 (0x40): 0/1	0	Error 7: ErrorLocalTempSensorShortCircuit
					Bit 7 (0x80): 0/1	0	Error 8: ErrorRemoteTempSensorShortCircuit
					Bit 8 (0x100): 0/1	0	Error 9: ErrorLocalTempSensorBelowMin
					Bit 9 (0x200): 0/1	0	Error 10: ErrorRemoteTempSensorBelowMin
					Bit 10 (0x400): 0/1	0	Error 11: ErrorLocalTempSensorAboveMax
					Bit 11 (0x800): 0/1	0	Error 12: ErrorRemoteTempSensorAboveMax
					Bit 12 (0x1000): 0/1	0	Error 13: WarningActuatorManualOverride
					Bit 13 (0x2000): 0/1	0	Error 14: ErrorActuatorBlocked
					Bit 14 (0x4000): 0/1	0	Error 15: ErrorFlowMeasurement
					Bit 16 (0x10000): 0/1	0	Error 17: Reverse Flow Detected
					Bit 17 (0x20000): 0/1	0	Error 18: ErrorActuatorComFailure