



Flextronic Connectivity guide

DEU Installations- und Betriebsanleitung

- Flamconnect-Gateway
- Analoge Ausgänge
- Digitale (separate) Ausgänge
- Schnittstelle zum Gebäudeverwaltungssystem (BMS)

that's excellence.



Sicherheitssymbole



Achtung!



Hochspannung



Heiße Oberfläche



Ätzend



Magnetfeld



Scharfer Gegenstand



Quetschgefahr für Hände



Handverletzung in Presse



Niedrige Temperatur



Giftiges Material



Heißer Dampf



Heißer Inhalt



Allgemeines Verbotssymbol



Nicht berühren



Keine offene Flamme



Kein Werkzeug



Nicht schieben



Nicht in die Lichtquelle starren



Allgemeines Gebotszeichen



Erdungsklemme mit Erde verbinden



Netzstecker aus der Steckdose ziehen



Siehe Bedienungsanleitung



Hände waschen



Kopfschutz tragen



Gehörschutz tragen



Augenschutz tragen



Fußschutz tragen



Schutzhandschuhe tragen



Maske tragen



Atemschutz tragen



Genau hinschauen



230V erforderlich



2 Personen tragen



Schwer



Zerbrechlich



Nicht in den Hausmüll werfen



Kreuzschlitzschraubendreher



Schlitzschraubendreher



Schraubenschlüssel



Bohren



Qualifizierter Installateur erforderlich

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Dieses Dokument ist eine Ergänzung zur Installations- und Bedienungsanleitung des Produkts, die Informationen zum Flamcomat G4 in Bezug auf Sicherheit, Gebrauch und Bedienung enthält.

Weitere Installationsanleitungen und Dokumente in verschiedenen Sprachen finden Sie auf www.flamco.aalberts-hfc.com/manuals.

Weitere Produktinformationen können von der entsprechenden Flamco-Niederlassung angefordert werden.

Legende:

-  Home
-  Einstellungen
-  Allgemeines
-  Service-Informationen

1. Korrekte Verwendung

Die Flextronic-Steuereinheit muss gemäß diesem Handbuch verwendet werden. Die Konformitätserklärung in der Originaldokumentation gilt weiterhin.

DEU

2. Produktbeschreibung

Die Flextronic ist eine universelle Steuereinheit für Flamco-Automaten. Sie verfügt über zahlreiche Kommunikationsoptionen, die im Menü für Flextronic-Zubehör aktiviert werden können:

Nicht angezeigte Anschlüsse sind für spezielles Automaten-Zubehör oder andere betriebliche Zwecke vorgesehen. Diese Anschlüsse dürfen nicht für eine Schnittstelle mit dem Kunden oder zur Kommunikation verwendet werden.

2.1. Verkabelungsdetails



1. Ethernet-Port für die BMS-Integration mit Kommunikation entweder im Modbus- oder Bacnet-Protokoll.
2. USB-Anschluss zum Speichern des Betriebsprotokolls oder zur Durchführung eines Firmware-Updates.
3. Canbus-Ports (paarweise verdreht) zur Verbindung mehrerer Flamco-Automaten untereinander.
4. RS-485-Ports (paarweise verdreht) zur Verbindung des Flamco Remote Service Gateway (Flamconnect) oder alternativ zur BMS-Integration über Modbus oder Bacnet.
5. Kabellose Schnittstelle (2.400-2.485 GHz) für die Verbindung mit einem Smartphone oder Tablet.
6. Analoge Spannungsausgangssignale zur Fernanzeige von Gefäßfüllstand und Systemdruck (0-10 V).
7. Digitale (diskrete) Ausgangssignale (250 V AC, max. 5 A, potentialfrei). Benutzerdefinierte Fehler und Warnungen können für die drei Anschlüsse im Flextronic-Alarms-Menü konfiguriert werden.

Die Installation, Datenverarbeitung und Erstinbetriebnahme müssen von geschultem, qualifiziertem und kompetentem Personal durchgeführt werden. Die entsprechenden nationalen Normen, Vorschriften und Regeln müssen eingehalten werden.

Die Installationsanleitung und weitere Dokumente in verschiedenen Sprachen finden Sie auf www.flamco.aalberts-hfc.com/manuals.

- Zusätzliche Kabel sind nicht im Lieferumfang enthalten oder können bei Flamco erworben werden.
- Flamco empfiehlt die Verwendung eines verdrehten und abgeschirmten Einzelkabels.
- Der Abschlusswiderstand beträgt 120 Ohm.
- Die maximal zulässige Kabellänge beträgt 500 m.

2.2. Flamconnect-Gateway

Voraussetzungen für den ordnungsgemäßen Betrieb

- Am Standort des Gateways muss eine gute GSM-Abdeckung vorhanden sein. Sollte dies nicht der Fall sein, kann der Artikel S90009 bestellt werden. Dies ist eine Antenne mit Kabel, das Kabel kann an das Gateway angeschlossen werden, die Antenne kann an einem Ort mit einem guten GSM-Netz platziert werden.
- Überprüfen Sie, ob die Antenne ordnungsgemäß mit dem Gateway verbunden ist.
- Die Kommunikation vom Flamcomat MK-U G4 Remote RS485-Port muss auf „Gateway“ eingestellt sein.
- Die für die Registrierung erforderliche Seriennummer befindet sich auf der Rückseite des Gateways.



Sicherheit

Welche Sicherheitsmaßnahmen gibt es?

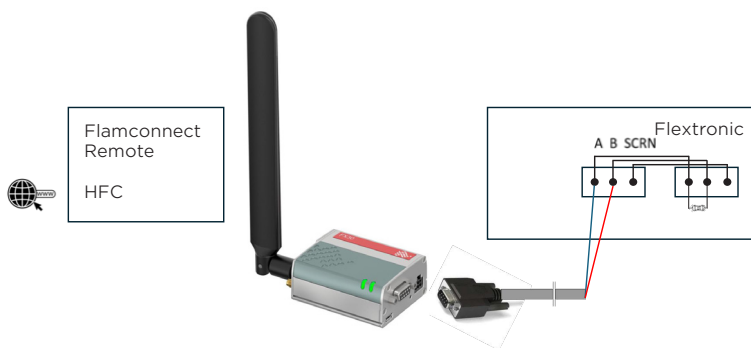
Wir nehmen Ihre Daten sehr ernst und haben daher eine Reihe von Sicherheitsmaßnahmen getroffen, um die Sicherheit Ihrer Daten zu gewährleisten. Im Folgenden finden Sie eine kleine Auswahl dieser Maßnahmen, um einen Eindruck von ihrem Umfang zu vermitteln:

- Das Portalteam konzentriert sich täglich auf die Sicherheit, mit Peer Reviews, statischer Codeprüfung, automatisierten Tests usw.
- Die Sicherheit ist in das mehrstufige Portal integriert. Entwickler müssen beispielsweise

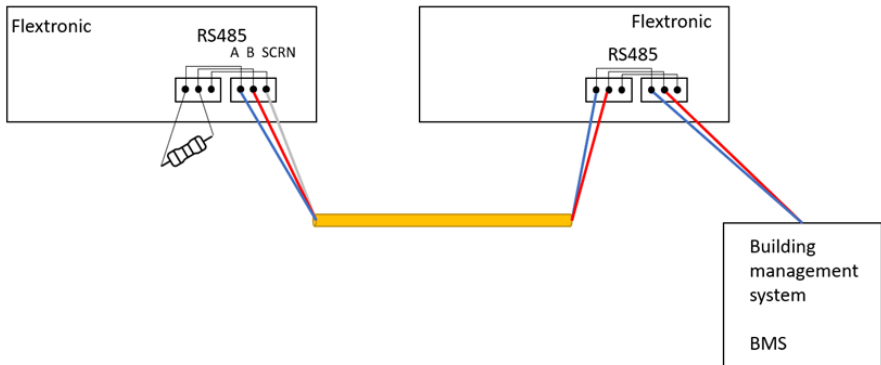
explizit für Situationen programmieren, in denen sie Daten benötigen, die dem angemeldeten Benutzer normalerweise nicht zugänglich sind, da diese Daten sonst einfach «unsichtbar» sind

- Der gesamte Zugang ist passwortgeschützt. Alle Benutzer werden mithilfe von Rollen und Berechtigungen autorisiert, wobei standardmäßige, von Microsoft zertifizierte Lösungen verwendet werden.
- IoT-Verbindungen werden mit TLS und Zugangsschlüsseln oder Zertifikaten verschlüsselt (je nach Kundenanforderungen).
- Unser Portal verfügt über Maßnahmen zum aktiven Schutz vor CORS, XSS, Content-Type-Sniffing, Framing, etc.
- Aktionen an sensiblen Daten (z.B. Gerätedaten / Benutzerkonten) werden in einem Audit Trail protokolliert.
- Die Bereitstellung ist vollständig automatisiert, um Konfigurationsfehler zu vermeiden, die zu Sicherheitsverletzungen führen könnten.
- Die interne und externe Sicherheit wird aktiv durch Pen-Tests und Sicherheitsaudits überprüft.
- Zusätzlich zu unseren eingebauten Sicherheitsmaßnahmen können wir auch zusätzliche Maßnahmen konfigurieren, z. B. Cloudflare zum Schutz vor DDOS-Angriffen oder Azure API Management zur Drosselung von API-Clients, die zu viele Anfragen stellen.
- Zu guter Letzt nutzen wir Microsoft Azure und alles, was es in Bezug auf Sicherheit, verschlüsselte Daten im Ruhezustand, Schlüsseltresore, keinen praktischen physischen Zugriff und natürlich ihr Team aus erstklassigen Sicherheitsexperten zu bieten hat!

Durch die Nutzung von Flamconnect Remote stimmen Sie dem Vertrag und den Nutzungsbedingungen zu.



2.3. BMS-Konnektivität Modbus und Bacnet



Die Kommunikation als Modbus und Bacnet ist auf dem RS-485-BUS nicht gleichzeitig möglich. Wenn beide

Protokolle erforderlich sind, muss eines der Protokolle über die Ethernet-Verbindung (IP) laufen. Bei Verwendung des Flamconnect Remote Service Gateway ist der RS485-Port für diese Funktion vorgesehen. Wenn das Modbus- oder Bacnet-Protokoll ebenfalls erforderlich ist, kann dies nur über die Ethernet-Verbindung (IP) erreicht werden.

2.4. Verbundene Flamco-Automaten

Please note that automats first need to be commissioned as a standalone automat, before the Co-Operation mode can be initiated. Make sure the automats intended for the Co-Operation mode are connected hydraulically to the same system.

All automats must be wired and connected via the same network. According to the Connectivity Guide the total cable length should not exceed 500m. Flamco does not provide a cable (Flamco recommends twisted single pair shielded cable).

In the Flextronic controller, the CAN-bus interface is used for the Co-Operation network. The termination resistor (120Ω) is provided by default on each Flextronic. The resistor should be installed only at the ends of the line as illustrated in the image below.

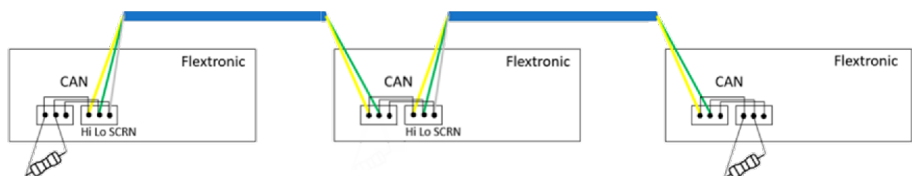
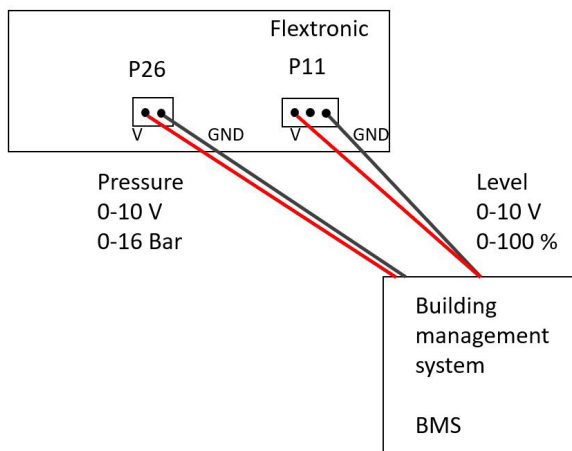


Figure: Connection example of CAN-bus interfacing

2.5. Analoge Ausgabe-Signale (Kunde)

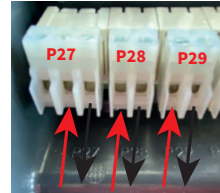
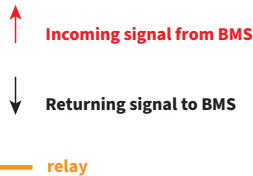
Zum Erfassen des Spannungsanalogsignals von Systemdruck und Gefäßfüllstand.



2.6. Digitale (separate) Ausgabe-Signale

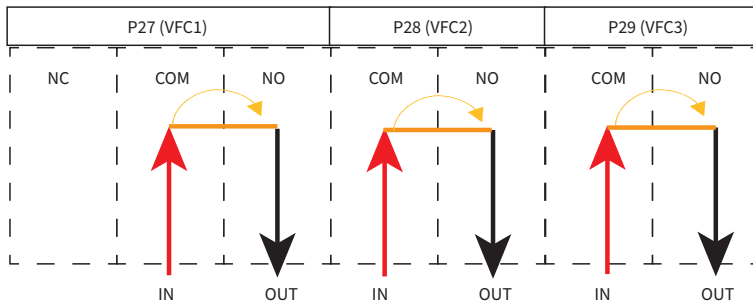
GUI settings:
Invert polarity: off

Specifications of VFC:
5A @ 240VAC (non-inductive)



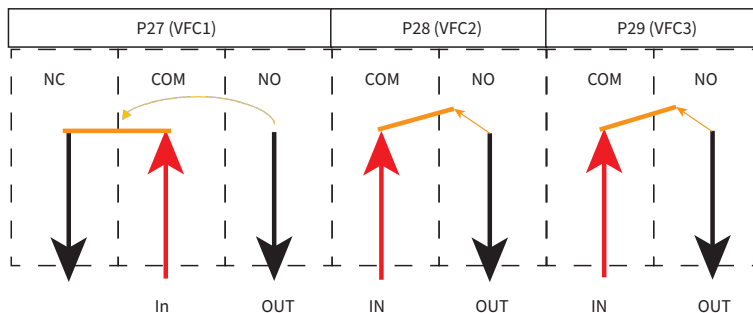
No Fault

(NO) Relay closed at (NO) OUT when controller powered up and running without error



Faulty

(NO) Relay openend at (NO) OUT when controller is powered down, running with error or cable broken



Anzeigen des Automatenstatus. Der kundenspezifische Fehler kann jedem Ausgang zugewiesen werden. Der Ausgang P29 ist ein Kesselverriegelungssignal der Art >110 °C, er steht in dieser Betriebsart nicht zur Alarmauslösung in diesem Modus zur Verfügung.

3. Kabellose Konfiguration und Einstellungen

Die Konfiguration ist mit der Flamconnect-App möglich.

Geben Sie zur Verbindung das Kennwort ein. Das Kennwort ist auf dem QR-Code-Etikett am Automaten zu finden oder wird auf dem Bildschirm angezeigt.

	Systeminformationen	Zeigt Informationen zum Automaten und der Steuerung an	
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Die Konfiguration der Kundenschnittstellen und der Kommunikationsprotokolle ist über das Steuerungsmenü zugänglich.

	Zubehör	Zum Aktivieren des erweiterten Automatenzubehörs	
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3.1. Einstellungen der Kommunikationsschnittstelle

Ethernet:

IP-Adresse	192.168.100.150
IP-Maske	255.255.255.0
IP-Gateway	192.168.100.1

RS-485:

Flextronic ist Slave	
Geräte-ID	auswählbar
Baud-Rate	19200
Parität	8-n-1

Es ist möglich, der gleichen Schnittstelle jeweils nur ein Protokoll zuzuordnen. Wenn das Remote Service Gateway angeschlossen ist, sind Modbus- und Bacnet-Protokolle über RS-485 nicht verfügbar. Verwenden Sie für die BMS-Integration stattdessen den Ethernet-Anschlv



Note: Modbus has a U16 Limit therefore some U32 values are stored on 2 register addresses, these need to be combined to receive the actual U32 value (see Modbus tables in chapter 4).

3.2. Digitale (diskrete) Ausgabeprogrammierung

Es ist möglich, den potentialfreien Ausgängen kundenspezifische Fehler (Fehler und Warnungen) zuzuordnen. Wenn mehr als ein Fehler dem gleichen Ausgang zugeordnet wird, wird der Ausgang aktiv, wenn einer der zugeordneten Fehler für diese Ausgabe aktiv ist.

Die Konfiguration der Fehler ist im Flextronic-Menü verfügbar:

	Alarme	Zum Zuweisen von Alarmmeldungen für potentialfreie Ausgänge	
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4. Modbus-Mapping – Tabelle

4.1. Flamcomat

Register	Access	Name	Type	Unit	Range
0x0001	R	Current working pressure	UINT16	cbar	0..16000
0x0002	R	Current vessel level	UINT16	%	0...100
0x0003	R	Outputs state (1-on)	UINT16		Bit0: Motor 1 active Bit1: Motor 2 active Bit2: Valve 1 active Bit3: Valve 2 active Bit4: Valve 3 active Bit8: Degassing On (Enabled) Bit9: Degassing mode (0-normal, 1-turbo)
0x0004	R	Error table 1 (1-error active)	UINT16		Bit 0: Single pump/ compressor maximum run time error Bit 1: Redundant pumps/ compressor maximum run time error Bit 2: Load dependant pumps/ compressor maximum run time error Bit 3: Single pump/ compressor current error Bit 4: Pump A current error (double pump/ compressor configuration) Bit 5: Pump B current error (doublepump/ compressor configuration) Bit 6: Pumps A and B current error (double pump/ compressor configuration) Bit 7: Pump C/ compressor current error Bit 8: Self-learning valve correction error Bit 9: Self-learning pump correction error Bit 10: Pressure sensor current exceeded Bit 11: Pressure sensor no current Bit 12: Load cell current exceeded Bit 13: Load cell no current Bit 14: Pump A/ compressor power consumption too high Bit 15: Pump B/ compressor power consumption too high

Register	Access	Name	Type	Unit	Range
0x0005	R	Error table 2 (1-error active)	UINT16		Bit 0: Pump C power consumption too high Bit 1: Maximum Runtime P35 M1 exeeded Bit 2: Maximum Runtime P36 M2 exeeded Bit 3: Maximum supplation threaded water amount exeeded Bit 4: Pump running, no decrease of water level in vessel* Bit 5: Valve open, no increase of water level in vessel* Bit 6: Maximum runtime P33 V1 exeeded Bit 7: Maximum runtime P34 V2 exeeded Bit 8: To run quick fill* Bit 9: To run system fill* Bit 10: System run in auto mode Bit 11: Quick system filling active, V to stop* Bit 12: System filling active, V to stop* Bit 13: Manual mode active, press V to start automat Bit 14: Diaphragm rupture Bit 15: Spare
0x0006	R	Error table 3(1-error active)	UINT16		Bit 0: Water level increase in vessel without Flamcomat activity* Bit 1: Water level decrease in vessel without Flamcomat activity* Bit 2: Maintenance 1 is due Bit 3: Initial fill failed Bit 4: Maximum refill time exeeded Bit 5: Maximum drain time exeeded* Bit 6: No refill flow Bit 7: Amount refill water too much Bit 8: Spare Bit 9: Spare Bit 10: Spare Bit 11: Initial fill active Bit 12: Manual initial fill active Bit 13: System fill timer expired Bit 14: Quick fill timer expired* Bit 15: Maintenance 2 is due
0x0007	R	Error table 4 (1-error active)	UINT16		Bit 0: Maintenance 3 is due Bit 1: Maintenance 4 is due Bit 2: Spare Bit 3: Spare Bit 4: Spare Bit 5: Spare Bit 6: Spare Bit 7: Spare Bit 8: Spare Bit 9: Spare Bit 10: Spare Bit 11: Spare Bit 12: Spare Bit 13: Spare Bit 14: Spare Bit 15: Spare
0x0008	R	Operational hours total	UINT16	hours	

Register	Access	Name	Type	Unit	Range
0x0009	R	Availability (0 - No, 1 - Yes)	UINT16		Bit 0: P35 M1 pressure increase Bit 1: P36 M2 Pressure increase Bit 2: P33 V1 (pressure decrease/ compressor valve) Bit 3: P34 V2 (pressure decrease/ compressor valve) Bit 4: P31 V3 (filling pump/ valve) Bit 8: Minimum pressure limiter Bit 9: Diaphragm rupture sensor Bit 10: Maximum temperature sensor
0x000A	R	Pressure setpoint	UINT16	cbar	0..16000
0x000B	R	Minimum water level (absolute)	UINT16	%	
0x000C	R	Level refeeding On (absolute)	UINT16	%	
0x000D	R	Level refeeding Off (absolute)	UINT16	%	
0x000E	R	Minimum level alarm limit	UINT16	%	
0x000F	R	Maximum level alarm limit	UINT16	%	
0x0010	R	Nominal volume of vessel	UINT16	l	
0x0011	R	Operational mode	UINT16		0 - single mode, 1 - redundant mode 2 - load-dependent
0x0012	R	Total refill liters	UINT16	l	
0x0013	R	Total refill minutes	UINT16	minute	

* Not applicable for the Flamcomat MK-U G4

4.2. Flexfiller

Register	Access	Name	Type	Unit	Formatting
0x0000	R	SystemPressure	U16	mbar	Decimal
0x0001	R	SupplyPressure	U16	mbar	Decimal
0x0002	R	TankLevel	U16	%	Decimal
0x0003	R	VacuumPressure	U16	mbar	Decimal
0x000A	R	PressureSetpoint	U16	mbar	Decimal
0x000B	R	SafetyValveSetting	U16	mbar	Decimal
0x000C	R	Calculated_LowPressureAlarm	U16	mbar	Decimal
0x000D	R	Calculated_High PressureAlarm	U16	mbar	Decimal
0x000E	R	VesselVolume	U16	l	Decimal

Register	Access	Name	Type	Unit	Formatting
0x0030	R	DigitalInput	U16	Binary	NA
0x0031	R	DigitalOutput	U16	Binary	Bit 0: P36 (Pump 2 / NC) Bit 1: P35 (Pump 1/Direct drain valve) Bit 2: P34 (NC) Bit 3: P33 (NC) Bit 4: P32 (NC) Bit 5: P31(Refill / Inlet valve) Bit 6: P29 (VFC 1) Bit 7: P28 (VFC 2) Bit 8: P27 (VFC 3)
0x0032	R	AccessoryPresenceMask	U16	Binary	NA
0x0033	R	AccessoryPresenceMask	U16	Binary	NA
0x0034	R	DaysToTheNextMaintenance1	U16	count	Decimal
0x0035	R	DaysToTheNextMaintenance2	U16	count	Decimal
0x0036	R	DaysToTheNextMaintenance3	U16	count	Decimal
0x0037	R	DaysToTheNextMaintenance4	U16	count	Decimal
0x0040	R	Errors_3	U16	Binary	NA (For Future Use)
0x0041	R	Errors_2	U16	Binary	NA (For Future Use)
0x0042	R	Errors_1	U16	Binary	NA (For Future Use)
0x0043	R	Errors_0	U16	Binary	Bit 0: ALR_SYSTEM_PRESSURE_LOW Bit 1: ALR_SYSTEM_PRESSURE_BELOW_MINIMUM Bit 2: ALR_SYSTEM_PRESSURE_SENSOR_OOB_LOW Bit 3: ALR_SYSTEM_PRESSURE_SENSOR_OOB_HIGH Bit 4: ALR_SYSTEM_PRESSURE_HIGH Bit 5: ALR_SYSTEM_FILL_TIMER_EXPIRED Bit 6: ALR_SAFETY_VALVE_ACTIVE Bit 7: ALR_VESSEL_PRECHARGE_LOST Bit 8: ALR_PUMP_1_OVER_CURRENT Bit 9: ALR_PUMP_2_OVER_CURRENT Bit 10: ALR_PUMP_1_NO_CURRENT Bit 11: ALR_PUMP_2_NO_CURRENT
0x0044	R	Warnings_0	U16	Binary	NA (For Future Use)

Register	Access	Name	Type	Unit	Formatting
0x0045	R	Warnings_1	U16	Binary	Bit 0: WRN_SYPHON_FLUSH_DETECTED
0x0046	R	Warnings_2	U16	Binary	Bit 0: WRN_SYSTEM_FILL_ACTIVE Bit 1: WRN_SYSTEM_FILL_ON_HOLD Bit 2: WRN_ANTI_LEGIONELLA_RUNNING Bit 3: WRN_DEVICE_REBOOT Bit 4: WRN_TANK_LEVEL_SENSOR_OOB_LOW Bit 5: WRN_TANK_LEVEL_SENSOR_OOB_HIGH Bit 6: WRN_PUMP_DRY_RUN Bit 8: WRN_MANUAL_SYSTEM_FILL
0x0046	R	Warnings_2	U16	Binary	Bit 9: WRN_PUMP_1_RUNTIME Bit 10: WRN_PUMP_2_RUNTIME Bit 11: WRN_ANTI_LEGIONELLA_RECOVERY Bit 12: WRN_VACUUM_PRESSURE_SENSOR_OOB_LOW Bit 13: WRN_VACUUM_PRESSURE_SENSOR_OOB_HIGH Bit 14: WRN_FILTER_FULL Bit 15: WRN_VACUUM_ERROR
0x0047	R	Warnings_3	U16	Binary	Bit 0: WRN_SYSTEM_PRESSURE_HIGH Bit 1: WRN_MAX_AMOUNT_TOPUP_WATER Bit 2: WRN_SYSTEM_PRESSURE_LOW Bit 3: WRN_NUMBER_OF_TOPUPS Bit 4: WRN_SUPPLY_PRESSURE_TOO_LOW Bit 5: WRN_SUPPLY_PRESSURE_TOO_HIGH Bit 6: WRN_SUPPLY_PRESSURE_SENSOR_OOB_LOW Bit 7: WRN_SUPPLY_PRESSURE_SENSOR_OOB_HIGH Bit 8: WRN_SYSTEM_FILL_SELF_LEARNING Bit 9: WRN_MANUAL_MODE Bit 10: WRN_MAXIMUM_TOPUP_TIME_EXCEEDED Bit 11: WRN_NO_TOPUP_FLOW Bit 12: WRN_MAINTENANCE_1_DUE
0x0047	R	Warnings_3	U16	Binary	Bit 13: WRN_MAINTENANCE_2_DUE Bit 14: WRN_MAINTENANCE_3_DUE Bit 15: WRN_MAINTENANCE_4_DUE

0x0050	R	OverallRuntime_H	U16	h	Decimal (Combine 0x0050&0x0051 to read the full U32 value)
0x0051	R	OverallRuntime_L	U16	h	Decimal (Combine 0x0050&0x0051 to read the full U32 value)
0x0052	R	TotalFilledVolume_H	U16	ml	Decimal (Combine 0x0052&0x0053 to read the full U32 value)
0x0053	R	TotalFilledVolume_L	U16	ml	Decimal (Combine 0x0052&0x0053 to read the full U32 value)
0x0054	R	TotalFillTime_H	U16	s	Decimal (Combine 0x0054&0x0055 to read the full U32 value)
0x0055	R	TotalFillTime_L	U16	s	Decimal (Combine 0x0054&0x0055 to read the full U32 value)
0x0056	R	ActivationsMv1_H	U16	count	Decimal (Combine 0x0056&0x0057 to read the full U32 value)
0x0057	R	ActivationsMv1_L	U16	count	Decimal (Combine 0x0056&0x0057 to read the full U32 value)
0x0058	R	ActivationsMv2_H	U16	count	Decimal (Combine 0x0058&0x0059 to read the full U32 value)
0x0059	R	ActivationsMv2_L	U16	count	Decimal (Combine 0x0058&0x0059 to read the full U32 value)
0x005A	R	RuntimeMv1_H	U16	s	Decimal (Combine 0x005A&0x005B to read the full U32 value)
0x005B	R	RuntimeMv1_L	U16	s	Decimal (Combine 0x005A&0x005B to read the full U32 value)
0x005C	R	RuntimeMv2_H	U16	s	Decimal (Combine 0x005C&0x005D to read the full U32 value)
0x005D	R	RuntimeMv2_L	U16	s	Decimal (Combine 0x005C&0x005D to read the full U32 value)
0x005E	R	ActivationsPump1_H	U16	count	Decimal (Combine 0x005E&0x005F to read the full U32 value)
0x005F	R	ActivationsPump1_L	U16	count	Decimal (Combine 0x005E&0x005F to read the full U32 value)
0x0060	R	ActivationsPump2_H	U16	count	Decimal (Combine 0x0060&0x0061 to read the full U32 value)
0x0061	R	ActivationsPump2_L	U16	count	Decimal (Combine 0x0060&0x0061 to read the full U32 value)
0x0062	R	ActivationsValve1_H	U16	count	Decimal (Combine 0x0062&0x0063 to read the full U32 value)

0x0063	R	ActivationsValve1_L	U16	count	Decimal (Combine 0x0062&0x0063 to read the full U32 value)
0x0064	R	RuntimePump1_H	U16	s	Decimal (Combine 0x0064&0x0065 to read the full U32 value)
0x0065	R	RuntimePump1_L	U16	s	Decimal (Combine 0x0064&0x0065 to read the full U32 value)
0x0066	R	RuntimePump2_H	U16	s	Decimal (Combine 0x0066&0x0067 to read the full U32 value)
0x0067	R	RuntimePump2_L	U16	s	Decimal (Combine 0x0066&0x0067 to read the full U32 value)
0x0068	R	RuntimeValve1_H	U16	s	Decimal (Combine 0x0068&0x0069 to read the full U32 value)
0x0069	R	RuntimeValve1_L	U16	s	Decimal (Combine 0x0068&0x0069 to read the full U32 value)
0x006A	R	NrOfNormalTopUps_H	U16	count	Decimal (Combine 0x006A&0x006B to read the full U32 value)
0x006B	R	NrOfNormalTopUps_L	U16	count	Decimal (Combine 0x006A&0x006B to read the full U32 value)
0x006C	R	NrOfEmergencyStops_H	U16	count	Decimal (Combine 0x006C&0x006D to read the full U32 value)
0x006D	R	NrOfEmergencyStops_L	U16	count	Decimal (Combine 0x006C&0x006D to read the full U32 value)
0x006E	R	SafetyValveActivations_H	U16	count	Decimal (Combine 0x006E&0x006F to read the full U32 value)
0x006F	R	SafetyValveActivations_L	U16	count	Decimal (Combine 0x006E&0x006F to read the full U32 value)
0x0070	R	ActivationsVfc1_H	U16	count	Decimal (Combine 0x0070&0x0071 to read the full U32 value)
0x0071	R	ActivationsVfc1_L	U16	count	Decimal (Combine 0x0070&0x0071 to read the full U32 value)
0x0072	R	ActivationsVfc2_H	U16	count	Decimal (Combine 0x0072&0x0073 to read the full U32 value)
0x0073	R	ActivationsVfc2_L	U16	count	Decimal (Combine 0x0072&0x0073 to read the full U32 value)
0x0074	R	ActivationsVfc3_H	U16	count	Decimal (Combine 0x0074&0x0075 to read the full U32 value)
0x0075	R	ActivationsVfc3_L	U16	count	Decimal (Combine 0x0074&0x0075 to read the full U32 value)

4.3. Vacumat Eco G4

Function code	Address	Access	Name	Type	Unit	Formatting
Input register 0x04	0x0000	R	System Pressure	S16	mbar	Decimal
Input register 0x04	0x0001	R	Vacuum Pressure	S16	mbar	Decimal
Input register 0x04	0x0002	R	Temperature	S16	cdeg C	Decimal
Input register 0x04	0x000A	R	Pressure Setpoint	U16	mbar	Decimal
Input register 0x04	0x000B	R	SafetyValve Setting	U16	mbar	Decimal
Input register 0x04	0x000C	R	LowPressure AlarmLimit	U16	mbar	Decimal
Input register 0x04	0x000D	R	HighPressure AlarmLimit	U16	mbar	Decimal

Input register 0x04	0x0030	R	DigitalInput	U16	Binary	Bit 0	P18 level switch
						Bit 1	P19 Water meter input
						Bit 2	P20 NA
						Bit 3	P21 External Top-up in
						Bit 4	P22 Gassensor
						Bit 5	P23 NA
						Bit 6	P24 Pump Fault Contact
						Bit 7	P25 Standby input
Input register 0x04	0x0031	R	DigitalOutput	U16	Binary	Bit 8-15	NA
						Bit 0	P36 (Pump 2 ENA only)
						Bit 1	P35 (Pump 1)
						Bit 2	P34 (NA)
						Bit 3	P33 (Vacumat: 3 way valve / ENA: Valve1)
						Bit 4	P32 (NA)
						Bit 5	P31 (Vacumat: NA / ENA: System fill)
						Bit 6	P29 (VFC 1)
						Bit 7	P28 (VFC 2)
						Bit 8	P27 (VFC 3)
Input register 0x04	0x0032	R	AccessoryPresence Mask	U16	Binary	Bit 9-15	NA
						NA	
Input register 0x04	0x0033	R	AccessoryPresence Mask	U16	Binary	NA	

Function code	Adress	Access	Name	Type	Unit	Formatting
Input register 0x04	0x0034	R	DaysToTheNext Maintenance1	U16	count	Decimal
Input register 0x04	0x0035	R	DaysToTheNext Maintenance2	U16	count	NA (For Future Use)
Input register 0x04	0x0036	R	DaysToTheNext Maintenance3	U16	count	NA (For Future Use)
Input register 0x04	0x0037	R	DaysToTheNext Maintenance4	U16	count	NA (For Future Use)
Input register 0x04	0x0040	R	Errors_3	U16	Binary	NA (For Future Use)
Input register 0x04	0x0041	R	Errors_2	U16	Binary	NA (For Future Use)
Input register 0x04	0x0042	R	Errors_1	U16	Binary	NA (For Future Use)

Function code	Adress	Access	Name	Type	Unit	Formatting	
Input register 0x04	0x0043	R	Errors_0	U16	Binary	Bit 0	ALR_SYSTEM_ PRESSURE_ LOW
						Bit 1	ALR_SYSTEM_ PRESSURE_ BELOW_ MINIMUM
						Bit 2	ALR_SYSTEM_ PRESSURE_ SENSOR_OOB_ LOW
						Bit 3	ALR_SYSTEM_ PRESSURE_ SENSOR_OOB_ HIGH
						Bit 4	ALR_SYSTEM_ PRESSURE_ HIGH
						Bit 5	ALR_VACUUM_ PRESSURE_ SENSOR_OOB_ LOW
						Bit 6	ALR_VACUUM_ PRESSURE_ SENSOR_OOB_ HIGH
						Bit 7	ALR_ TEMPERATURE_ SENSOR_ OOB_LOW
						Bit 8	ALR_ TEMPERATURE_ SENSOR_OOB_ HIGH
						Bit 9	ALR_PUMP_ OVER_CURRENT
						Bit 10	ALR_PUMP_NO_ CURRENT
						Bit 11	ALR_VACUUM_ ERROR
						Bit 12	ALR_LOW_ WATER_LEVEL
						Bit 13	ALR_ TEMPERATURE_ RANGE_ UNDERSHOT
						Bit 14	ALR_ TEMPERATURE_ RANGE_ OVERSHOT
						Bit 15	ALR_VACUUM_ TEST_FAILED

Function code	Address	Access	Name	Type	Unit	Formatting	
Input register 0x04	0x0044	R	Warnings_3	U16	Binary	NA (For Future Use)	
Input register 0x04	0x0045	R	Warnings_2	U16	Binary	NA (For Future Use)	
Input register 0x04	0x0046	R	Warnings_1	U16	Binary	Bit 0	WRN_VACUUM_PRESSURE_TOO_LOW
						Bit 1	WRN_VACUUM_PRESSURE_TOO_HIGH
						Bit 2	WRN_CONSTANTLY_GAS_DETECTED
						Bit 3	WRN_VACUUM_TEST_IN_PROGRESS
						Bit 4-15	NA
Input register 0x04	0x0047	R	Warnings_0	U16	Binary	Bit 0	WRN_SYSTEM_PRESSURE_LOW
						Bit 1	WRN_SYSTEM_PRESSURE_HIGH
						Bit 2	WRN_NO_REFILL_FLOW
						Bit 3	WRN_TIME_BETWEEN_REFILLS
						Bit 4	WRN_NUMBER_OF_REFILLS
						Bit 5	WRN_FILLING_WITHOUT_REQUEST
						Bit 6	WRN_MAX_AMOUNT_REFILL_WATER
						Bit 7	WRN_REFILL_RUNTIME_EXCEEDED
						Bit 8	WRN_MAINTENANCE_1_DUE
						Bit 9	WRN_TP_MOTOR
						Bit 10	WRN_MANUAL_MODE
						Bit 11	WRN_DEVICE_REBOOT
						Bit 12	NA
						Bit 13	WRN_FILTER_FULL
						Bit 14	WRN_EXTERNAL_STANDBY_REQUEST
						Bit 15	WRN_INTERNAL_STANDBY

Function code	Adress	Access	Name	Type	Unit	Formatting
Input register 0x04	0x0050	R	OverallRuntime_H	U16	H	Decimal
Input register 0x04	0x0051	R	OverallRuntime_L	U16	H	Decimal
Input register 0x04	0x0052	R	TotalFilledVolume_H	U16	L	Decimal
Input register 0x04	0x0053	R	TotalFilledVolume_L	U16	L	Decimal
Input register 0x04	0x0054	R	TotalFillTime_H	U16	S	Decimal
Input register 0x04	0x0055	R	TotalFillTime_L	U16	S	Decimal
Input register 0x04	0x0056	R	Total number degassing cycles_H	U16	count	Decimal
Input register 0x04	0x0057	R	TotalNumber DegassingCycles_L	U16	count	Decimal
Input register 0x04	0x0058	R	nr of topups_H	U16	count	Decimal
Input register 0x04	0x0059	R	nr of topups_L	U16	count	Decimal
Input register 0x04	0x005A	R	ActivationsPump_H	U16	count	Decimal
Input register 0x04	0x005B	R	ActivationsPump_L	U16	count	Decimal
Input register 0x04	0x005C	R	ActivationsValve1_H	U16	count	Decimal
Input register 0x04	0x005D	R	ActivationsValve1_L	U16	count	Decimal
Input register 0x04	0x005E	R	ActivationsValve2_H	U16	count	Decimal
Input register 0x04	0x005F	R	ActivationsValve2_L	U16	count	Decimal
Input register 0x04	0x0060	R	RuntimePump_H	U16	S	Decimal
Input register 0x04	0x0061	R	RuntimePump_L	U16	S	Decimal
Input register 0x04	0x0062	R	RuntimeValve1_H	U16	S	Decimal
Input register 0x04	0x0063	R	RuntimeValve1_L	U16	S	Decimal
Input register 0x04	0x0064	R	RuntimeValve2_H	U16	S	Decimal
Input register 0x04	0x0065	R	RuntimeValve2_L	U16	S	Decimal
Input register 0x04	0x0066	R	SumOfGasEvacuation Times_H	U16	count	Decimal
Input register 0x04	0x0067	R	SumOfGasEvacuation Times_L	U16	count	Decimal
Input register 0x04	0x0068	R	NA (For Future Use)		-	NA (For Future Use)
Input register 0x04	0x0069	R	NA (For Future Use)		-	NA (For Future Use)
Input register 0x04	0x006A	R	LevelSwitchActivations_H	U16	count	Decimal

Function code	Adress	Access	Name	Type	Unit	Formatting
Input register 0x04	0x006B	R	LevelSwitchActivations_L	U16	count	Decimal
Input register 0x04	0x006C	R	GasSensorActivations_H	U16	count	Decimal
Input register 0x04	0x006D	R	GasSensorActivations_L	U16	count	Decimal
Input register 0x04	0x006E	R	ActivationsVfc1_H	U16	count	Decimal
Input register 0x04	0x006F	R	ActivationsVfc1_L	U16	count	Decimal
Input register 0x04	0x0070	R	ActivationsVfc2_H	U16	count	Decimal
Input register 0x04	0x0071	R	ActivationsVfc2_L	U16	count	Decimal
Input register 0x04	0x0072	R	ActivationsVfc3_H	U16	count	Decimal
Input register 0x04	0x0073	R	ActivationsVfc3_L	U16	count	Decimal

5. Bacnet-mapping tabelle

5.1. Flamcomat

Object ID	Access	Object Name	Type	Unit	Range
OBJECT_ANALOG_VALUE:0	R	Current working pressure	UINT16	cbar	0..16000
OBJECT_ANALOG_VALUE:1	R	Current vessel level	UINT16	%	0...100
OBJECT_ANALOG_VALUE:2	R	Outputs state (1-on)	UINT16		Bit 0: P35 M1 active (pump/compressor) Bit 1: P36 M2 active (pump/compressor) Bit 2: P33 V1 active (valve 1) Bit 3: P34 V2 active (valve 2) Bit 4: P31 V3 active (valve 3) Bit 8: Degassing On (Enabled)* Bit 9: Degassing mode (0-normal, 1-turbo)*
OBJECT_ANALOG_VALUE:3	R	Error table 1 (1-error active)	UINT16		Bit 0: Single pump/ compressor maximum run time error Bit 1: Redundant pumps/ compressor maximum run time error Bit 2: Load dependent pumps/ compressor maximum run time error Bit 3: Single pump/compressor current error Bit 4: Pump A current error (double pump/ compressor configuration) Bit 5: Pump B current error (double pump/ compressor configuration) Bit 6: Pumps A and B/ compressor current error (double pump c configuration) Bit 7: Pump C/ compressor current error Bit 8: Self-learning valve correction error Bit 9: Self-learning pump/ compressor correction error Bit 10: Pressure sensor current exceeded Bit 11: Pressure sensor no current Bit 12: Load cell current exceeded Bit 13: Load cell no current Bit 14: Pump A/ compressor power consumption too high Bit 15: Pump B/ compressor power consumption too high

Object ID	Access	Object Name	Type	Unit	Range
OBJECT_ ANALOG_ VALUE:4	R	Error table 2 (1-error active)	UINT16		Bit 0: Pump C/ compressor power consumption too high Bit 1: Maximum runtime P35 M1 exeeded Bit 2: Maximum runtime P36 M2 exeeded Bit 3: Maximum supplation threaded water amount exeeded Bit 4: Pump/ compressor running, no decrease of water level in vessel Bit 5: Valve open, no increase of water level in vessel Bit 6: Maximum runtime P33 V1 exeeded Bit 7: Maximum runtime P34 V2 exeeded Bit 8: To run quick fill* Bit 9: To run system fill* Bit 10: System run in auto mode Bit 11: Quick system filling active, V to stop* Bit 12: System filling active, V to stop* Bit 13: Manual mode active, press V to start automat Bit 14: Diaphragm rupture Bit 15: Spare
OBJECT_ ANALOG_ VALUE:5	R	Error table 3 (1-error active)	UINT16		Bit 0: Water level increase in vessel without Flamcomat activity* Bit 1: Water level decrease in vessel without Flamcomat activity* Bit 2: Maintenance 1 is due Bit 3: Initial fill failed Bit 4: Maximum refill time exeeded Bit 5: Maximum drain time exeeded* Bit 6: No refill flow Bit 7: Amount refill water too much Bit 8: Spare Bit 9: Spare Bit 10: Spare Bit 11: Initial fill active Bit 12: Manual initial fill active Bit 13: System fill timer expired* Bit 14: Quick fill timer expired* Bit 15: Maintenance 2 is due
OBJECT_ ANALOG_ VALUE:6	R	Error table 4 (1-error active)	UINT16		Bit 0: Maintenance 3 is due Bit 1: Maintenance 4 is due Bit 2: Spare Bit 3: Spare Bit 4: Spare Bit 5: Spare Bit 6: Spare Bit 7: Spare Bit 8: Spare Bit 9: Spare Bit 10: Spare Bit 11: Spare Bit 12: Spare Bit 13: Spare Bit 14: Spare Bit 15: Spare

Object ID	Access	Object Name	Type	Unit	Range
OBJECT_ ANALOG_ VALUE:7	R	Operational hours total	UINT16	hours	
OBJECT_ ANALOG_ VALUE:8	R	Availability (0 - No, 1 - Yes)	UINT16		Bit 0: P35 M1 pressure increase Bit 1: P36 M2 Pressure increase Bit 2: P33 V1 (pressure decrease/ compressor valve) Bit 3: P34 V2 (pressure decrease/ compressor valve) Bit 4: P31 V3 (filling pump/ valve) Bit 8: Minimum pressure limiter Bit 9: Diaphragm rupture sensor Bit 10: Maximum temperature sensor
OBJECT_ ANALOG_ VALUE:9	R	Pressure setpoint	UINT16	cbar	0..16000
OBJECT_ ANALOG_ VALUE:10	R	Minimum water level (absolute)	UINT16	%	
OBJECT_ ANALOG_ VALUE:11	R	Level refeeding On (absolute)	UINT16	%	
OBJECT_ ANALOG_ VALUE:12	R	Level refeeding Off (absolute)	UINT16	%	
OBJECT_ ANALOG_ VALUE:13	R	Minimum level alarm limit	UINT16	%	
OBJECT_ ANALOG_ VALUE:14	R	Maximum level alarm limit	UINT16	%	
OBJECT_ ANALOG_ VALUE:15	R	Nominal volume of vessel	UINT16	l	
OBJECT_ ANALOG_ VALUE:16	R	Operational mode	UINT16		0 - single mode, 1 - redundant mode 2 - load-dependent
OBJECT_ ANALOG_ VALUE:17	R	Total refill liters	UINT16	l	
OBJECT_ ANALOG_ VALUE:18	R	Total refill minutes	UINT16	minute	

* Not applicable for the Flamcomat MK-U G4

5.2. Flexfiller

Object ID	Access	Object name	Type	Unit	Formatting
OBJECT_ANALOG_VALUE:0	R	"alarms"	U64	Binary	Bit 0: ALR_SYSTEM_PRESSURE_LOW Bit 1: ALR_SYSTEM_PRESSURE_BELOW_MINIMUM Bit 2: ALR_SYSTEM_PRESSURE_BELOW_MINIMUM Bit 3: ALR_SYSTEM_PRESSURE_SENSOR_OOB_HIGH Bit 4: ALR_SYSTEM_PRESSURE_HIGH Bit 5: ALR_SYSTEM_FILL_TIMER_EXPIRED Bit 6: ALR_SAFETY_VALVE_ACTIVE Bit 7: ALR_VESSEL_PRECHARGE_LOST Bit 8: ALR_PUMP_1_OVER_CURRENT Bit 9: ALR_PUMP_2_OVER_CURRENT Bit 10: ALR_PUMP_1_NO_CURRENT Bit 11: ALR_PUMP_2_NO_CURRENT
OBJECT_ANALOG_VALUE:1	R	"warnings"	U64	Binary	Bit 0: WRN_SYSTEM_PRESSURE_HIGH Bit 1: WRN_MAX_AMOUNT_TOPUP_WATER Bit 2: WRN_SYSTEM_PRESSURE_LOW Bit 3: WRN_NUMBER_OF_TOPUPS Bit 4: WRN_SUPPLY_PRESSURE_TOO_LOW Bit 5: WRN_SUPPLY_PRESSURE_TOO_HIGH Bit 6: WRN_SUPPLY_PRESSURE_SENSOR_OOB_LOW Bit 7: WRN_SUPPLY_PRESSURE_SENSOR_OOB_HIGH Bit 8: WRN_SYSTEM_FILL_SELF_LEARNING Bit 9: WRN_MANUAL_MODE Bit 10: WRN_MAXIMUM_TOPUP_TIME_EXCEEDED Bit 11: WRN_NO_TOPUP_FLOW

Object ID	Access	Object name	Type	Unit	Formatting
OBJECT_ ANALOG_ VALUE:1	R	"warnings"	U64	Binary	Bit 12: WRN_MAINTENANCE_1_DUE Bit 13: WRN_MAINTENANCE_2_DUE Bit 14: WRN_MAINTENANCE_3_DUE Bit 15: WRN_MAINTENANCE_4_DUE Bit 16: WRN_SYSTEM_FILL_ACTIVE Bit 17: WRN_SYSTEM_FILL_ON_HOLD Bit 18: WRN_ANTI_LEGIONELLA_RUNNING Bit 19: WRN_DEVICE_REBOOT Bit 20: WRN_TANK_LEVEL_SENSOR_OOB_LOW Bit 21: WRN_TANK_LEVEL_SENSOR_OOB_HIGH Bit 22: WRN_PUMP_DRY_RUN Bit 23: WRN_TANK_OVERFLOW Bit 24: WRN_MANUAL_SYSTEM_FILL Bit 25: WRN_PUMP_1_RUNTIME Bit 26: WRN_PUMP_2_RUNTIME Bit 27: WRN_ANTI_LEGIONELLA_RECOVERY Bit 28: WRN_VACUUM_PRESSURE_SENSOR_OOB_LOW Bit 29: WRN_VACUUM_PRESSURE_SENSOR_OOB_HIGH Bit 30: WRN_FILTER_FULL Bit 31: WRN_VACUUM_ERROR Bit 32: WRN_SYPHON_FLUSH_DETECTED
OBJECT_ ANALOG_ VALUE:2	R	"current system pressure"	U16	mbar	Decimal
OBJECT_ ANALOG_ VALUE:3	R	"current supply pressure"	U16	mbar	Decimal
OBJECT_ ANALOG_ VALUE:4	R	"current tank level"	U16	%	Decimal
OBJECT_ ANALOG_ VALUE:5	R	"current vacuum pressure"	U16	mbar	Decimal
OBJECT_ ANALOG_ VALUE:6	R	"pressure setpoint"	U16	mbar	Decimal
OBJECT_ ANALOG_ VALUE:7	R	"safety valve setting"	U16	mbar	Decimal
OBJECT_ ANALOG_ VALUE:8	R	"low pressure alarm limit"	U16	mbar	Decimal
OBJECT_ ANALOG_ VALUE:9	R	"high pressure alarm limit"	U16	mbar	Decimal
OBJECT_ ANALOG_ VALUE:10	R	"vessel volume"	U16	l	Decimal
OBJECT_ ANALOG_ VALUE:11	R	"digital input"	U16	Binary	NA

Object ID	Access	Object name	Type	Unit	Formatting
OBJECT_ ANALOG_ VALUE:12	R	"digital output"	U16	Binary	Bit 0: P36 (Pump 2 / NC) Bit 1: P35 (Pump 1/MV1 topup valve) Bit 2: P34 (NC) Bit 3: P33 (NC) Bit 4: P32 (NC) Bit 5: P31 (Inlet valve/MV2 Drain Valve) Bit 6: P29 (VFC 1) Bit 7: P28 (VFC 2) Bit 8: P27 (VFC 3)
OBJECT_ ANALOG_ VALUE:13	R	"accessories"	U32	Binary	NA
OBJECT_ ANALOG_ VALUE:14	R	"days to next maintenance 1"	U16	count	Decimal
OBJECT_ ANALOG_ VALUE:15	R	"days to next maintenance 2"	U16	count	Decimal
OBJECT_ ANALOG_ VALUE:16	R	"days to next maintenance 3"	U16	count	Decimal
OBJECT_ ANALOG_ VALUE:17	R	"days to next maintenance 4"	U16	count	Decimal
OBJECT_ ANALOG_ VALUE:18	R	"overall runtime"	U32	h	Decimal
OBJECT_ ANALOG_ VALUE:19	R	"total filled volume"	U32	ml	Decimal
OBJECT_ ANALOG_ VALUE:20	R	"total fill time"	U32	s	Decimal
OBJECT_ ANALOG_ VALUE:21	R	"activations MV1"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:22	R	"activations MV2"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:23	R	"runtime MV1"	U32	s	Decimal
OBJECT_ ANALOG_ VALUE:24	R	"runtime MV2"	U32	s	Decimal
OBJECT_ ANALOG_ VALUE:25	R	"activations Pump1"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:26	R	"activations Pump2"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:27	R	"activations Valve1"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:28	R	"runtime Pump1"	U32	s	Decimal

Object ID	Access	Object name	Type	Unit	Formatting
OBJECT_ ANALOG_ VALUE:29	R	"runtime Pump2"	U32	s	Decimal
OBJECT_ ANALOG_ VALUE:30	R	"runtime Valve1"	U32	s	Decimal
OBJECT_ ANALOG_ VALUE:31	R	"nrOfNormalTopUps"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:32	R	"nrOfEmergencyStops"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:33	R	"safetyValveActivations"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:34	R	"activationsVfc1"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:35	R	"activationsVfc2"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:36	R	"activationsVfc3"	U32	count	Decimal

5.3. Vacumat Eco G4

Object ID	Access	Name	Type	Unit	Formatting
OBJECT_ANALOG_VALUE:0	R	"alarms"	U64	Binary	Bit 0 ALR_SYSTEM_PRESSURE_LOW
					Bit 1 ALR_SYSTEM_PRESSURE_BELOW_MINIMUM
					Bit 2 ALR_SYSTEM_PRESSURE_SENSOR_OOB_LOW
					Bit 3 ALR_SYSTEM_PRESSURE_SENSOR_OOB_HIGH
					Bit 4 ALR_SYSTEM_PRESSURE_HIGH
					Bit 5 ALR_VACUUM_PRESSURE_SENSOR_OOB_LOW
					Bit 6 ALR_VACUUM_PRESSURE_SENSOR_OOB_HIGH
					Bit 7 ALR_TEMPERATURE_SENSOR_OOB_LOW
					Bit 8 ALR_TEMPERATURE_SENSOR_OOB_HIGH
					Bit 9 ALR_PUMP_OVER_CURRENT
					Bit 10 ALR_PUMP_NO_CURRENT
					Bit 11 ALR_VACUUM_ERROR
					Bit 12 ALR_LOW_WATER_LEVEL
					Bit 13 ALR_TEMPERATURE_RANGE_UNDERSHOT
OBJECT_ANALOG_VALUE:0	R	"alarms"	U64	Binary	Bit 14 ALR_TEMPERATURE_RANGE_OVERSHOT
					Bit 15 ALR_VACUUM_TEST_FAILED
					Bit 16-63 NA

Object ID	Access	Name	Type	Unit	Formatting
OBJECT_ ANALOG_ VALUE:1	R	"warnings"	U64	Binary	Bit 0 WRN_SYSTEM_PRESSURE_LOW
					Bit 1 WRN_SYSTEM_PRESSURE_HIGH
					Bit 2 WRN_NO_REFILL_FLOW
					Bit 3 WRN_TIME_BETWEEN_REFILLS
					Bit 4 WRN_NUMBER_OF_REFILLS
					Bit 5 WRN_FILLING_WITHOUT_REQUEST
					Bit 6 WRN_MAX_AMOUNT_REFILL_WATER
					Bit 7 WRN_REFILL_RUNTIME_EXCEEDED
					Bit 8 WRN_MAINTENANCE_1_DUE
					Bit 9 WRN_TP_MOTOR
					Bit 10 WRN_MANUAL_MODE
					Bit 11 WRN_DEVICE_REBOOT
					Bit 12 WRN_PUMP_RUNTIME
					Bit 13 WRN_FILTER_FULL
					Bit 14 WRN_TOO_DEEP_VACUUM
					Bit 15 WRN_EXTERNAL_STANDBY_REQUEST
					Bit 16 WRN_INTERNAL_STANDBY
					Bit 17 WRN_VACUUM_PRESSURE_TOO_LOW
					Bit 18 WRN_VACUUM_PRESSURE_TOO_HIGH
					Bit 19 WRN_CONSTANTLY_GAS_DETECTED
					Bit 20-63 NA
OBJECT_ ANALOG_ VALUE:2	R	"current system pressure"	S16	mbar	Decimal
OBJECT_ ANALOG_ VALUE:3	R	"current vacuum pressure"	S16	mbar	Decimal
OBJECT_ ANALOG_ VALUE:4	R	"Current teperature pressure"	S16	cDeg C	Decimal

Object ID	Access	Name	Type	Unit	Formatting	
OBJECT_ ANALOG_ VALUE:5	R	"pressure setpoint"	U16	mbar	Decimal	
OBJECT_ ANALOG_ VALUE:6	R	"safety valve setting"	U16	mbar	Decimal	
OBJECT_ ANALOG_ VALUE:7	R	"low pressure alarm limit"	U16	mbar	Decimal	
OBJECT_ ANALOG_ VALUE:8	R	"high pressure alarm limit"	U16	mbar	Decimal	
OBJECT_ ANALOG_ VALUE:9	R	"digital input"	U16	Binary	Decimal	
OBJECT_ ANALOG_ VALUE:10	R	"digital output"	U16	Binary	Bit 0	P36 (NA)
					Bit 1	P35 (Pump 1)
					Bit 2	P34 (NA)
					Bit 3	P33 (3 way valve)
					Bit 4	P32 (NA)
					Bit 5	P31 (System fill)
					Bit 6	P29 (VFC 1)
					Bit 7	P28 (VFC 2)
					Bit 8	P27 (VFC 3)
OBJECT_ ANALOG_ VALUE:11	R	"accessories"	U32	Binary	Bit 9-15	NA
					NA	
OBJECT_ ANALOG_ VALUE:12	R	"days to next maintenance 1"	U16	count	Decimal	
OBJECT_ ANALOG_ VALUE:13	R	"days to next maintenance 2"	U16	count	Decimal (NA future use)	
OBJECT_ ANALOG_ VALUE:14	R	"days to next maintenance 3"	U16	count	Decimal (NA future use)	
OBJECT_ ANALOG_ VALUE:15	R	"days to next maintenance 4"	U16	count	Decimal (NA future use)	
OBJECT_ ANALOG_ VALUE:16	R	"overall runtime"	U32	H	Decimal	
OBJECT_ ANALOG_ VALUE:17	R	"total filled volume"	U32	L	Decimal	
OBJECT_ ANALOG_ VALUE:18	R	"total fill time"	U32	S	Decimal	
OBJECT_ ANALOG_ VALUE:19	R	"total nr of degassing cycles"	U32	count	Decimal	

Object ID	Access	Name	Type	Unit	Formatting
OBJECT_ ANALOG_ VALUE:20	R	"nr of topups"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:21	R	"activations pump"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:22	R	"activations valve1"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:23	R	"activations valve2"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:24	R	"runtime pump"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:25	R	"runtime valve1"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:26	R	"runtime valve2"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:27	R	"sum of gas evacuation times"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:28	R	"level switch activations"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:29	R	"gas sensor activations"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:30	R	"activations vfc1"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:31	R	"activations vfc2"	U32	count	Decimal
OBJECT_ ANALOG_ VALUE:32	R	"activations vfc3"	U32	count	Decimal

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Notizen

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