

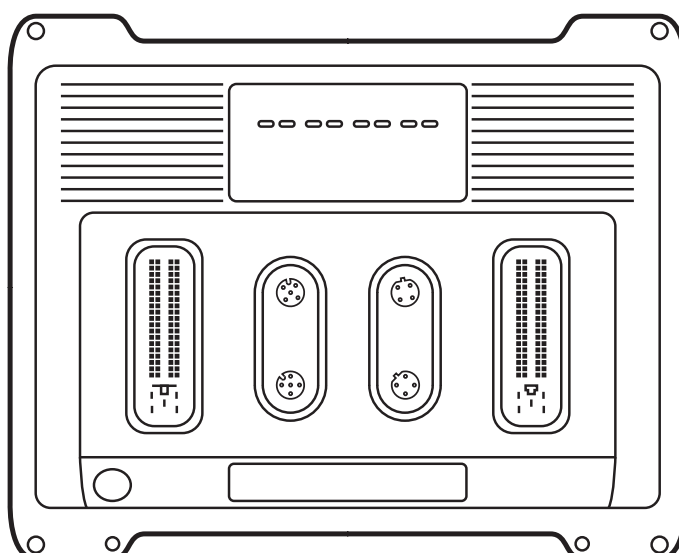


Installation instructions ecomatController

M30720
M30721

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7391126 / 00 05 / 2017



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1 Preliminary note

This document applies to devices of the type "ecomatController" (art. no.: M30720/M30721).

It is part of the device.

This document is intended for specialists. These specialists are people who are qualified by their appropriate training and their experience to see risks and to avoid possible hazards that may be caused during operation or maintenance of the device. The document contains information about the correct handling of the device.

Read this document before use to familiarise yourself with operating conditions, installation and operation. Keep this document during the entire duration of use of the device.

Adhere to the safety instructions.

Technical data, approvals, accessories and further information at www.ifm.com.

1.1 Explanation of symbols

- Instruction
- > Reaction, result
- [...] Designation of keys, buttons or indications
- Cross-reference
-  Important note
Non-compliance may result in malfunction or interference.
-  Information
Supplementary note

WARNING

Warning of serious personal injury.
Death or serious irreversible injuries may result.

CAUTION

Warning of personal injury.
Slight reversible injuries may result.

NOTE

Warning of damage to property.

2 Safety instructions

2.1 General

These instructions are an integral part of the device. They contain texts and figures concerning the correct handling of the device and must be read before installation or use.

Observe the operating instructions. Non-observance of the instructions, operation which is not in accordance with use as prescribed below, wrong installation or incorrect handling can seriously affect the safety of operators and machinery.

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2.2 Target group

These instructions are intended for authorised persons according to the EMC and low-voltage directives. The unit must be installed, connected and put into operation by a qualified electrician trained in safety technology.

2.3 Electrical connection

The device is designed for supply via a mobile on-board system (12/24 V DC battery operation).

Disconnect the unit externally before handling it. If necessary, also disconnect any independently supplied output load circuits.

If the device is not supplied by the mobile on-board system (12/24 V battery operation), it must be ensured that the external voltage is generated and supplied according to the criteria for safety extra-low voltage (SELV) as this voltage is supplied without further measures to the connected controller, the sensors and the actuators.

The wiring of all signals in connection with the SELV circuit of the device must also comply with the SELV criteria (safety extra-low voltage, safe electrical isolation from other electric circuits).

If the supplied SELV voltage is externally grounded (SELV becomes PELV), the responsibility lies with the user and the respective national installation regulations must be complied with. All statements in this document refer to the device the SELV voltage of which is not grounded.

The connection terminals may only be supplied with the signals indicated in the technical data and/or on the device label and only the approved accessories from ifm electronic gmbh may be connected.

2.4 Housing temperature

As described in the technical specifications below the device can be operated in a wide ambient temperature range. Because of the additional internal heating the housing walls can have high perceptible temperatures when touched in hot environments.

2.5 Tampering with the device

In case of malfunctions or uncertainties please contact the manufacturer. Any tampering with the device can seriously affect the safety of operators and machinery. This is not permitted and leads to the exclusion of any liability and warranty claims.

2.6 Electromagnetic compatibility

This is a class A product. It can cause radio interference in domestic areas. In this case the operator is requested to take appropriate measures.

2.7 Electrical welding on vehicles and plants

Welding work on the chassis frame must only be carried out by qualified persons.

Remove and cover the plus and minus terminals of the batteries.

Disconnect all contacts of the controller from the on-board system prior to welding on the vehicle or plant. Connect the earth terminal of the welding device directly to the part to be welded.

Do not touch the controller or electric cables with the welding electrode or the earth terminal of the welding device.

Protect the controller against weld slag.

3 Functions and features

The freely programmable controllers of the "ecomatController" series are rated for use under difficult conditions (e.g. extended temperature range, strong vibration, intensive EMC interference).

► Observe the operating conditions.

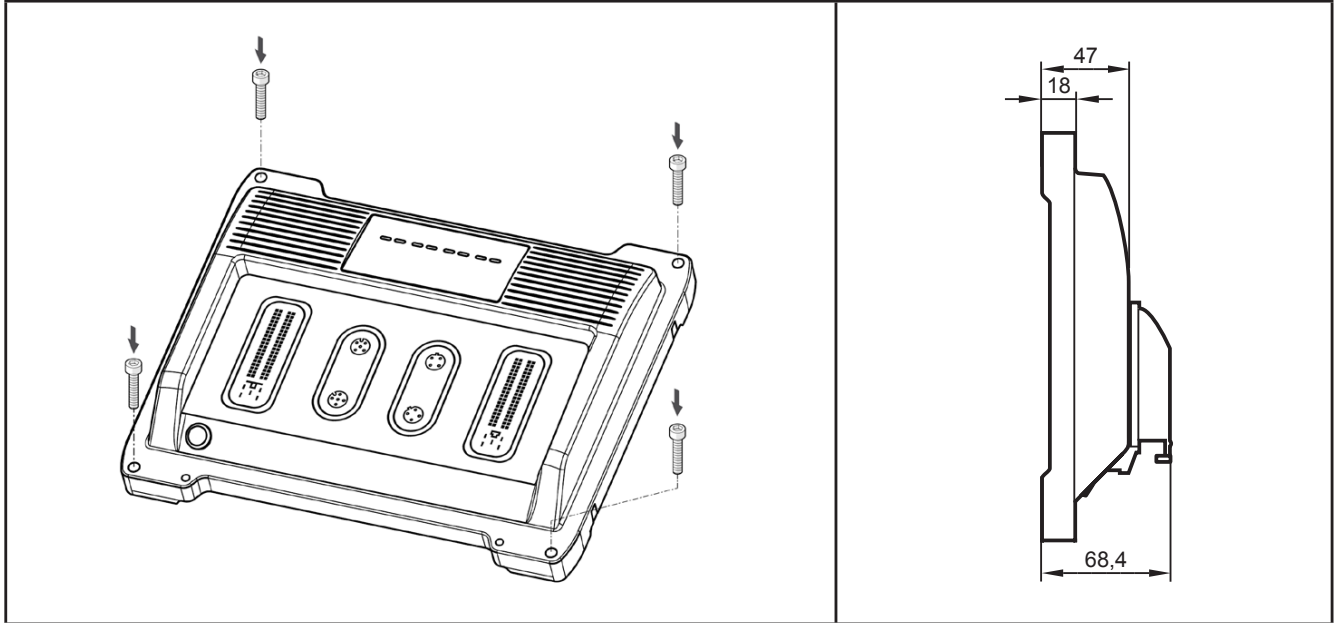
WARNING

- Functions and features
- Programming and important additions to these instructions
- Set-up

4 Installation

4.1 Fastening

- Fix the controller to a flat surface using 4 galvanized M6 screws.
Tightening torque: 10 ± 2 Nm



Installation

Total height with the attached connector.

NOTE

To avoid contact corrosion between the mounting screws and the module housing, do not use any stainless steel screws or nickel-plated screws.

In very corrosive environments such as extremely salty air, we recommend to use screws with surface finishing on a zinc/nickel basis with thick-film passivation and sealing. For normal corrosive requirements zinc-plated screws are sufficient.

4.2 Installation position

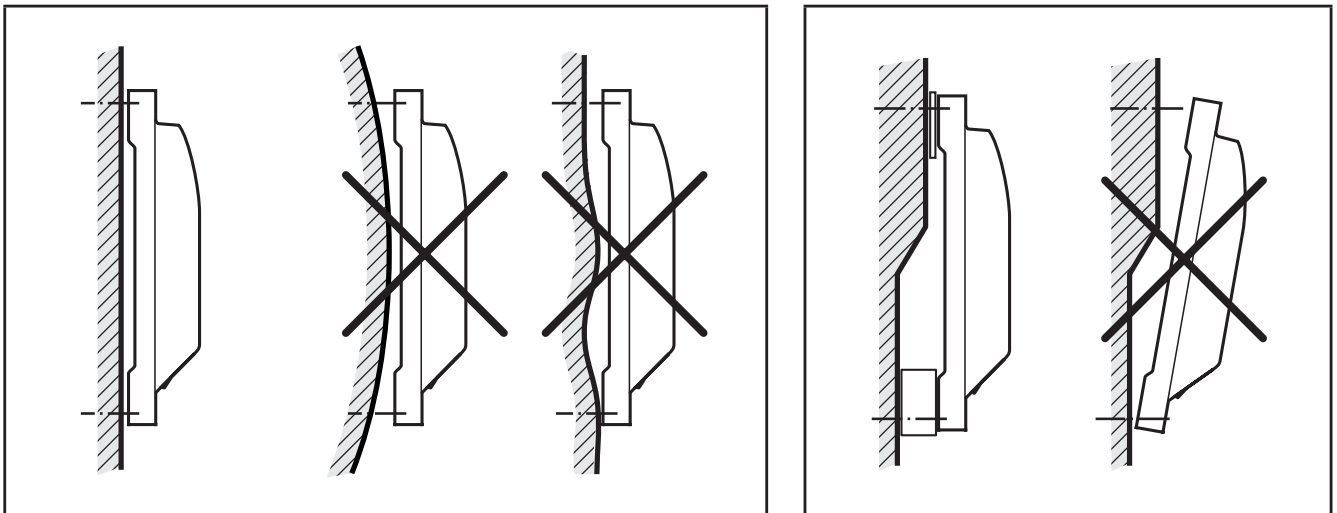
In wet environments, install the controller ensuring that no liquid remains on the connectors.

4.3 Mounting surface

NOTE

The housing must not be exposed to any torsional forces or mechanical stress.

- Use compensating elements if there is no flat mounting surface available.



Mounting surface

- During installation, ensure that the pollution degree is 2 or better. Pollution degree 2 is a light, common contamination which can be caused by occasional thawing or hand perspiration (DIN EN 60664-1).

4.4 Heat dissipation

- Ensure sufficient heat dissipation as the internal heating of the electronics is conducted away via the housing. The heat dissipation mainly takes place via the bottom of the housing. The housing is built in such a way that, when mounted on a flat surface, the heat can be dissipated through the bottom.

5 Electrical connection

5.1 Wiring

Wiring (→ 7 Technical data)



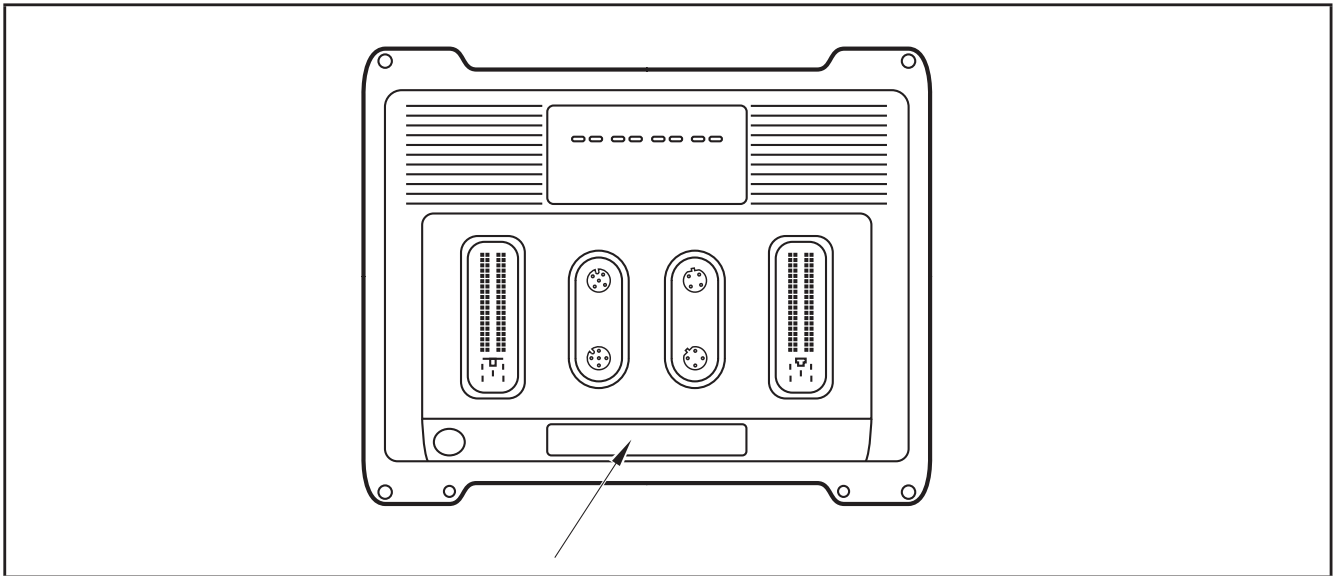
Only connect the connector pins as shown in the pin layout.
Unspecified connector pins remain unconnected.

- Connect all indicated supply cables and GND terminals.

5.1.1 Assignment of the connectors

- Note the device label.

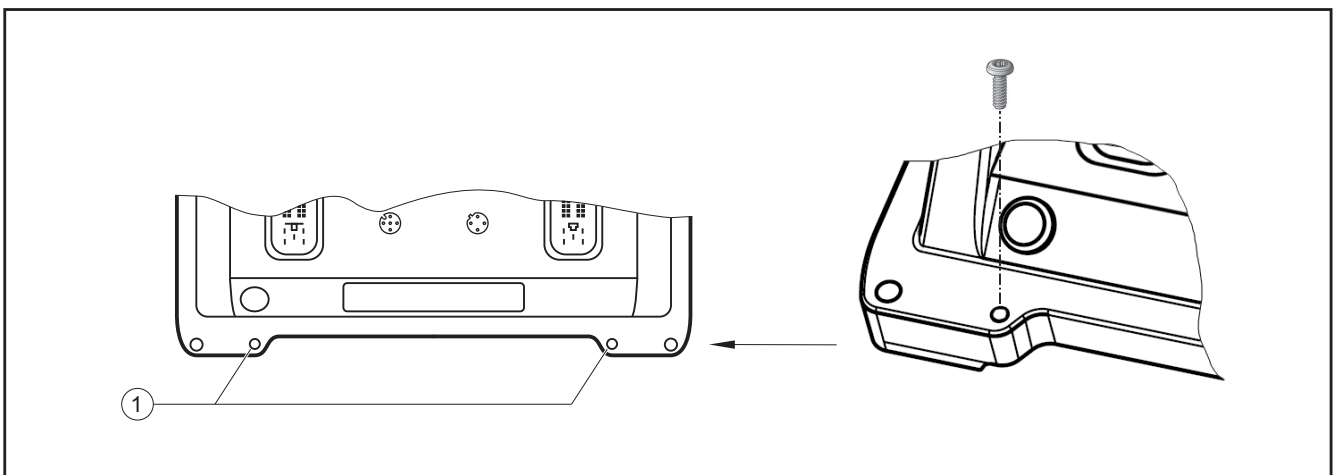
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Assignment of the connectors on the device label

- Use the M12 connector with gold-plated contacts.
- Unused sockets are equipped with protective caps (included).
- For protection rating IP 67, use a device with individually sealed cores.

5.2 Shield connection



1: Holes for shield connection



To ensure the protection of the device against electrical interference and the safe function of the device, the housing must be connected to the ground / body of the vehicle in the shortest possible way.

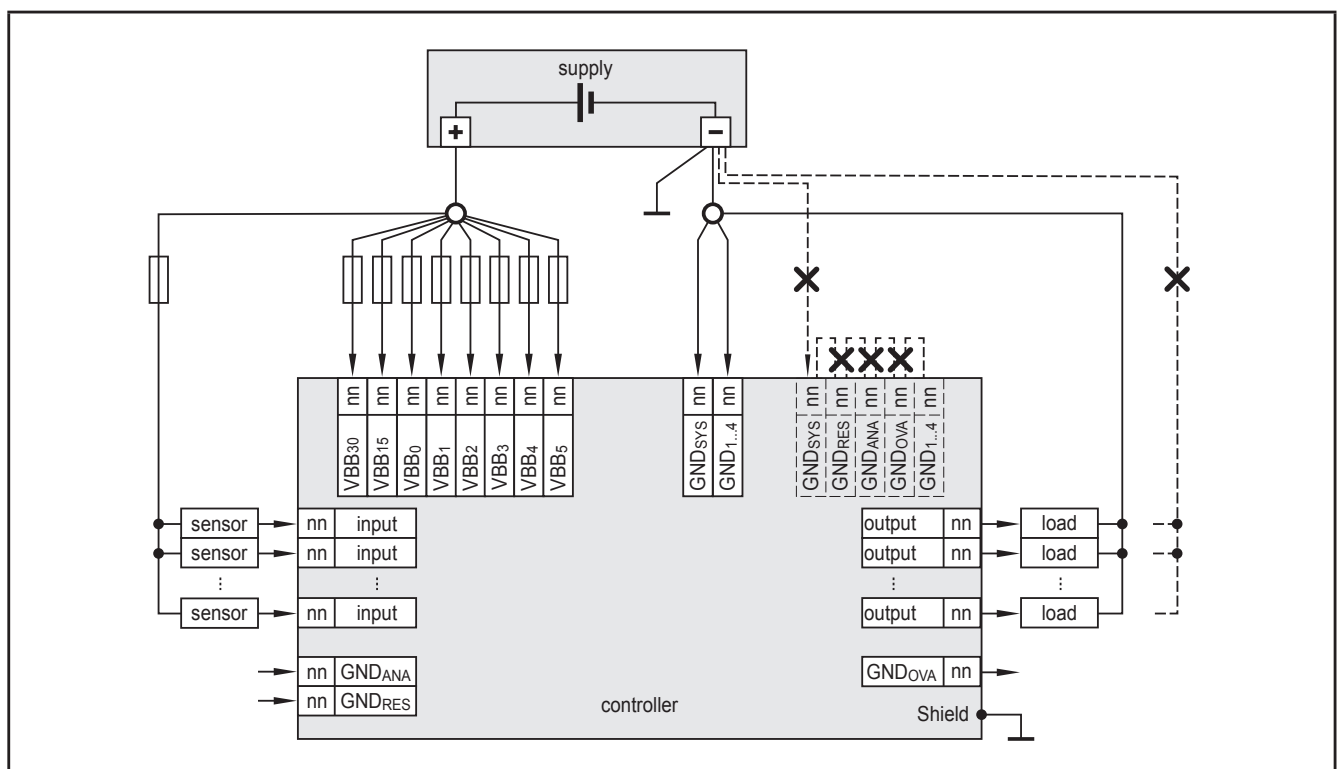
- Connect the device to the ground of the vehicle using the M4 self-tapping screw (included).

5.3 Fuses

- The individual electric circuits must be protected in order to protect the whole system.

Connector	Designation	Potential	Pin no.	Fuse
Connector A	Supply voltage sensors/module	VBB ₃₀	30	≤ 2 A time-lag
	Supply voltage sensors/module	VBB ₁₅	15	≤ 2 A time-lag
	Supply voltage output group 0	VBB ₀	04	≤ 15 A
	Supply voltage output group 1	VBB ₁	03	≤ 15 A
	Supply voltage output group 2	VBB ₂	01	≤ 15 A
Connector B	Supply voltage output group 3	VBB ₃	04	≤ 15 A
	Supply voltage output group 4	VBB ₄	03	≤ 15 A
	Supply voltage output group 5	VBB ₅	01	≤ 15 A

5.4 Laying the supply and signal cables



Connection of the supply and signal cables (X = not permitted), example M30721

⚠ WARNING

The linking of connections in the plug is not permitted and can affect the safety of operators and machinery.

- ▶ Basically all supply and signal cables must be laid separately.
- ▶ Connect supply and ground cables to the controller and the sensors/actuators via the respective common star point.



If a prewired connection cable is used, remove the cores with unused signal inputs and outputs.

Unused cores, in particular core loops, lead to interference coupling that can influence the connected controller.

In case of signal failures, operate inputs with shielded cables. Connect the shields to the shield connection on one side.

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VBB₀ must be connected in order to protect the controller against load dump

⚠ WARNING

If VBB₀ is not connected, this can affect the safety of operators and machinery.

Abbreviation	Input / output type
A	Analogue
B _H	Binary high side (CSO)
B _L	Binary low side (CSI)
FRQ _{L/H}	Frequency/pulse inputs configurable low side (CSI) / high side (CSO)
PWM _H	Pulse width modulation high side (CSO)
PWM _L	Pulse width modulation low side (CSI)
PWM _I	Pulse width modulation current-controlled
R	Resistor input

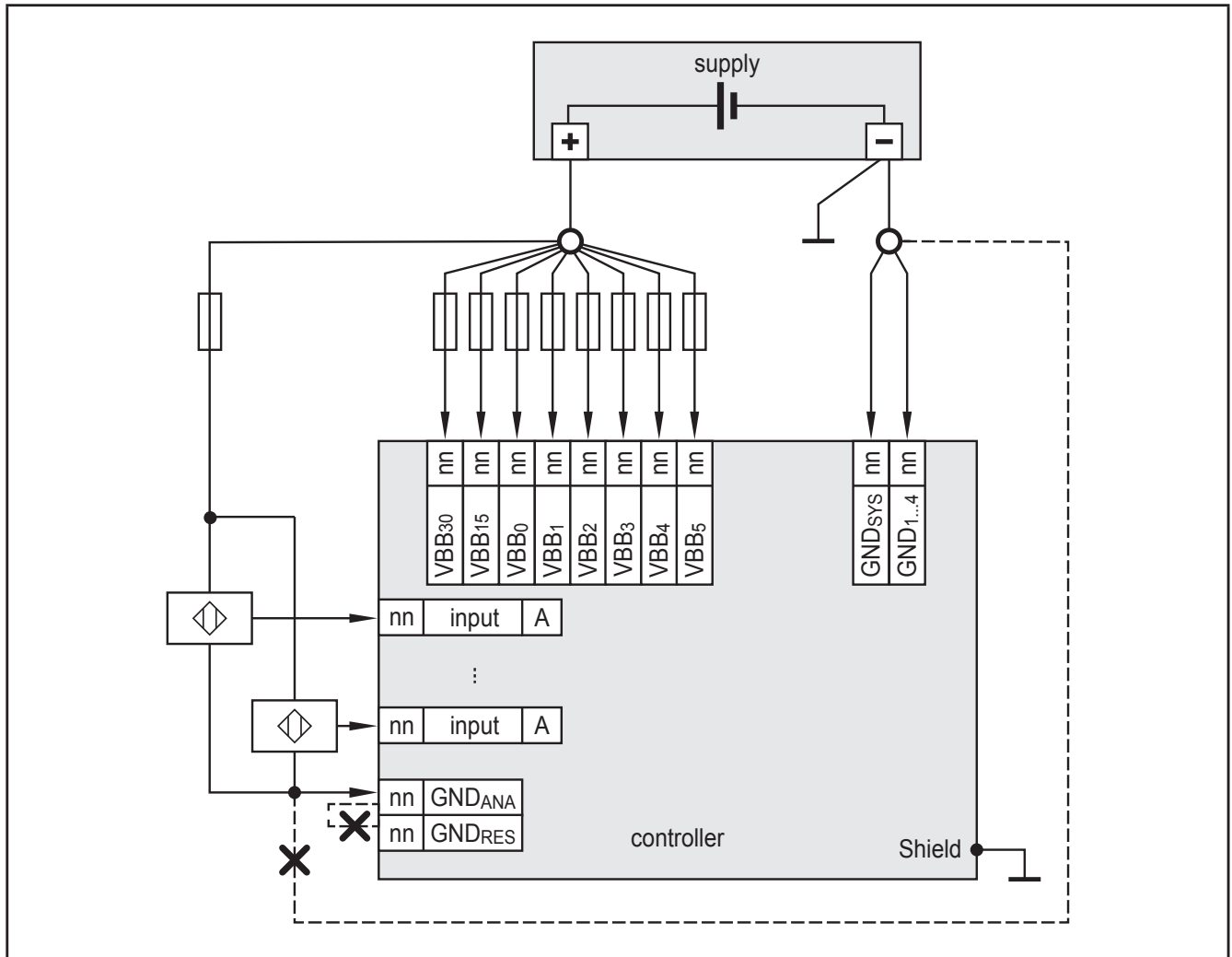
5.4.1 GND connections

- ▶ Connect the GND_{1...4} and GND_{SYS} connectors individually to the common GND star point.
- ▶ Connect the shield connection of the housing to the ground / body of the vehicle in the shortest possible way.

⚠ WARNING

Do not connect the GND_{ANA}, GND_{RES} and GND_{OVA} connectors to the common GND star point, but to the GND of the signal source or of the connected device.

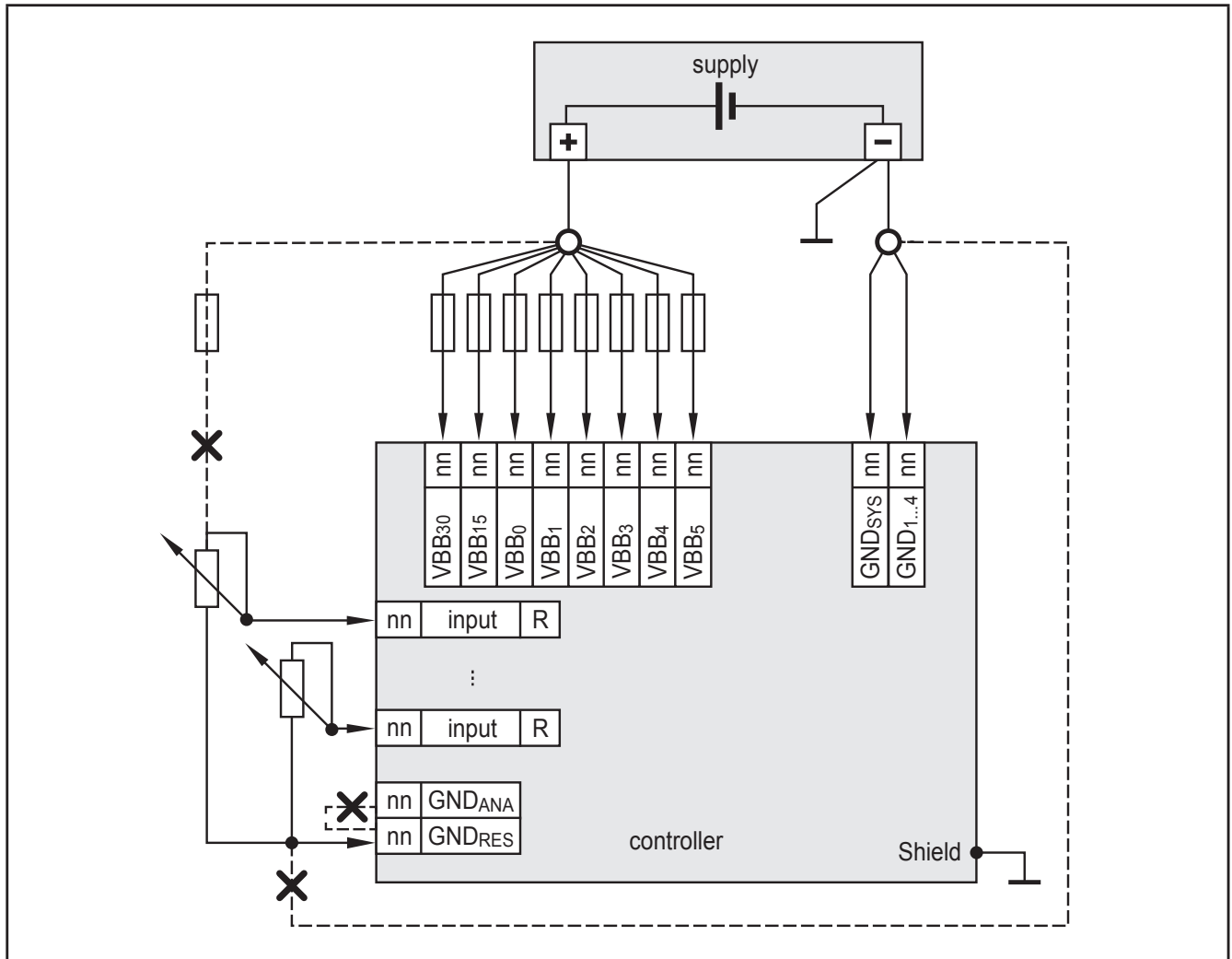
5.5 Analogue inputs



Connection of the analogue inputs (A)

- Connect GND_{ANA} to the GND of the signal source.
Do not connect GND_{ANA} to other GND connectors or to the GND star point.

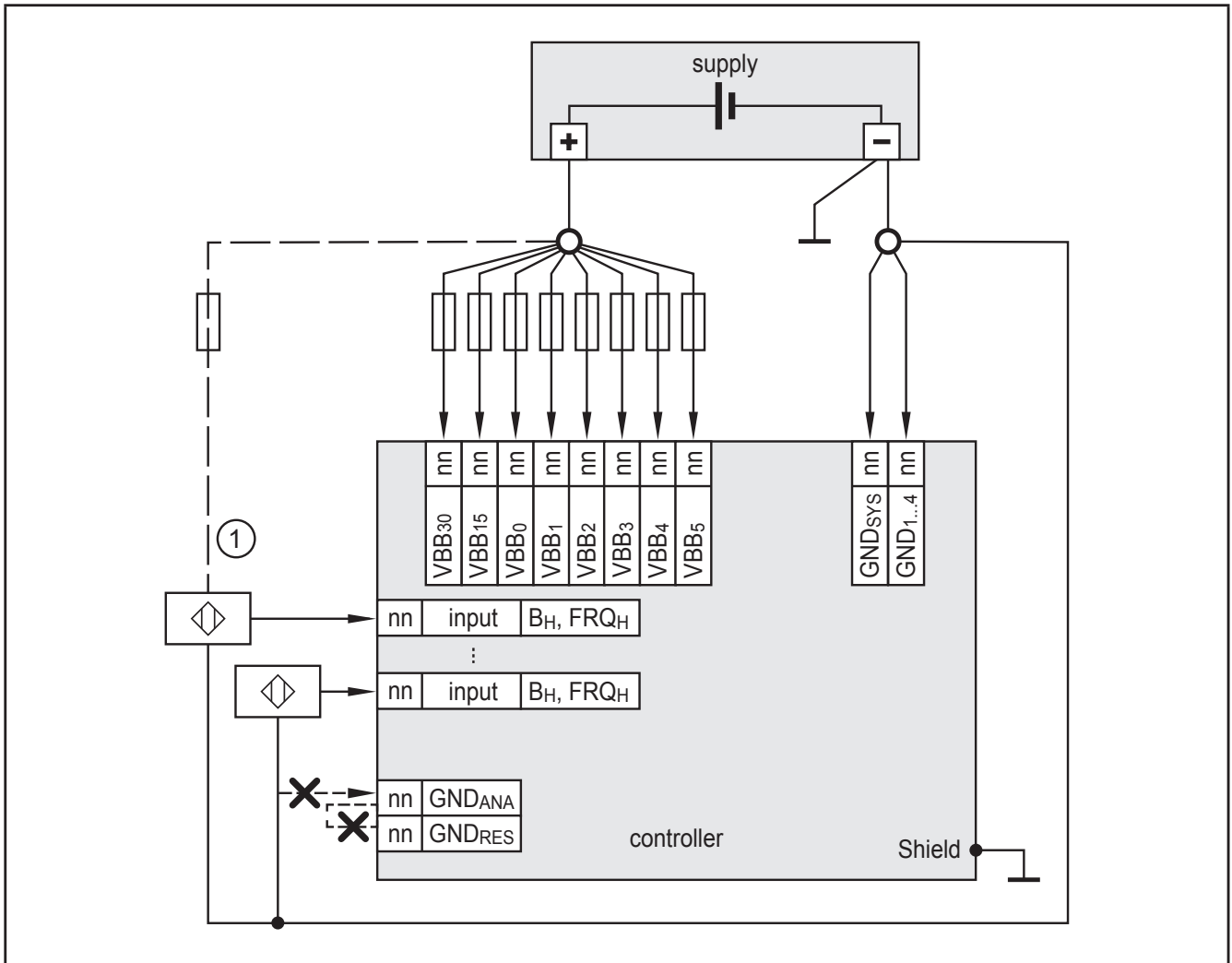
5.6 Resistor inputs



Connection of the resistor inputs (R)

- Connect GND_{RES} to the GND of the signal source.
Do not connect GND_{RES} to other GND connectors or to the GND star point.

5.7 High side digital inputs (CSO)

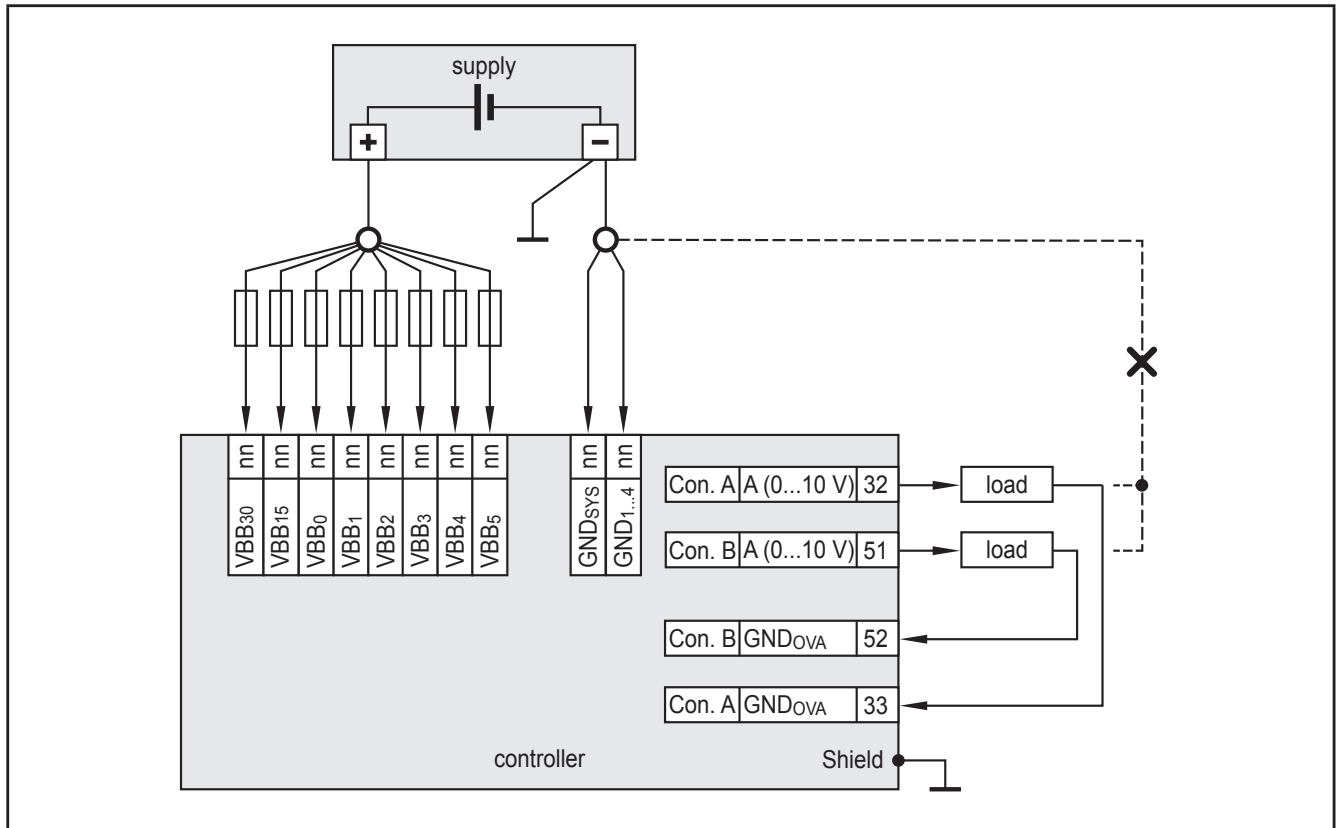


Connection of the high side inputs (B_H, FRQ_H)

1: Connection for 3-wire sensors

- Connect the GND of the signal source with the common GND star point. Do not connect the GND of the signal source to GND_{RES} or GND_{ANA}.

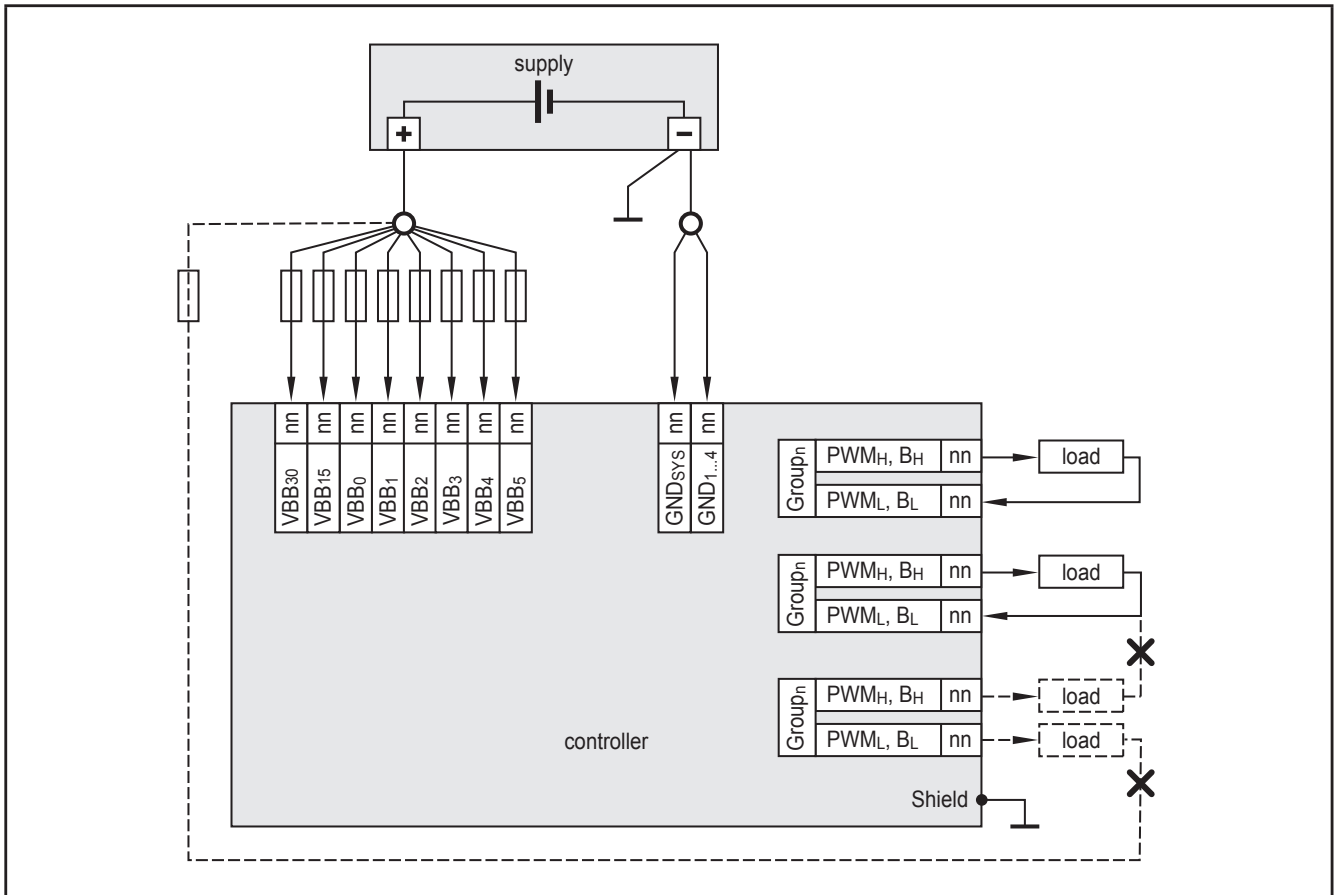
5.8 Analogue outputs



Connection of the analogue outputs (A)

- Connect the GND of the load to GND_{OVA}.
Do not connect the GND of the load to other GND connections or to the common GND star point.

5.9 Low side digital outputs (CSI) / H-bridge



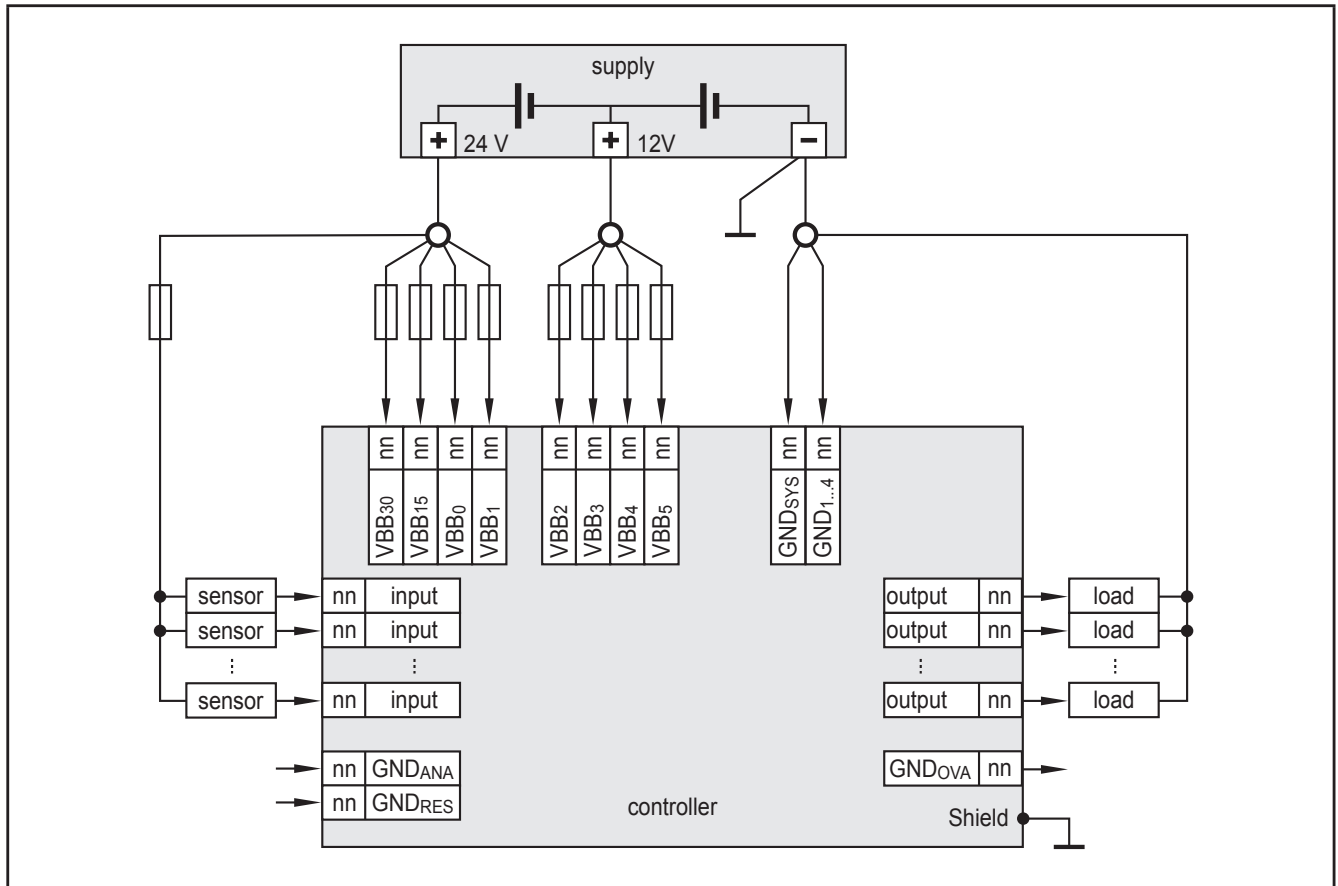
Connection of the low side digital outputs (PWM_L, B_L)

- Supply low-side outputs (B_L) via a high side output (B_H) of the same output group.

⚠ WARNING

Impermissible connection configurations of the low side outputs can affect the safety of operators and machinery.

5.10 Mixed operation (12 V / 24 V)



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Example connection to 24 V and 12 V power supply combined

The operation of the output groups is possible with different supply voltages.

- VBB₀, VBB₃₀ and VBB₁₅ must be connected at the common star point.

5.11 Connection technology

NOTE

Only connect the 81-pole connectors when the supply voltage is disconnected. "Hot plugging" is not permitted.

- Use twisted-pair cables for the CAN connection.
- Use a min. category 5 (Cat 5) cable for the Ethernet connection.

The RS-232 interface serves only as a service interface (e.g. for firmware updates).

6 Set-up

WARNING

Note the following:

- Functions and features
- Programming and important additions to these instructions
- Set-up

6.1 Interfaces and system requirements

The programmer creates the application program with the IEC 61131-3 compliant programming system CODESYS and loads the applications via the Ethernet, RS-232 or CAN interface to the controller.



System requirement for CODESYS 3.5 SP10:
Microsoft Windows 7, SP1 or higher

For applicable CODESYS versions see the ecomatController M30720 / M30721 system manual.

6.2 General

As delivered, the device is prepared for programming with CODESYS version 3.5 SP10 or higher.

Factory settings:

IP address: 192.168.82.247

Subnet mask: 255.255.255.0



The user is responsible for the safe function of the application programs which he created himself. If necessary, he must also obtain an approval from the supervisory and test organisations according to the national regulations.

6.3 Getting started

- ▶ Check if the pre-installed, latest version of the ifm operating system is required. If necessary, download and install a different version via TFTP.
- ▶ Connect the device to the notebook/PC via the Ethernet interface.
- ▶ Switch on the notebook/PC; Check the IP settings of the notebook/PC and change them if necessary.

Internet protocol: TCP/IP

IP address: 192.168.82.xxx (except for .247, s.a.)

Subnet mask: 255.255.255.0

Gateway IP address: 192.168.82.21

- ▶ Switch on the operating voltage of the device.
- > After the operating voltage has been applied, a project can be loaded.

6.4 Required documentation

In addition to the CODESYS programming system, the following documents are required for programming and set-up of the device:

- Programming manual CODESYS V3.5
(alternatively as online help)

The manuals can be downloaded from the internet:

www.ifm.com → Search → Art. no. → Documents & downloads

CODESYS online help:

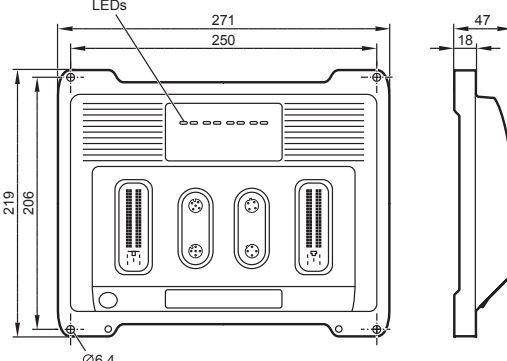
www.ifm.com → Service → Download → Control systems*

*) Download area with registration

7 Technical data

7.1 M30720

7.1.1 Mechanical and electric data

M30720 ecomatController/98 32-bit CPU TriCore processor 98 inputs/outputs 4 CAN interfaces Ethernet interface CODESYS 3.5 8...32 V $\overline{=}$	CE  E1
Technical data	Controller as black box system for the implementation of a central or decentralised system design
Mechanical data	closed, screened metal housing with screw connection
Housing	219 x 271 x 47 mm
Dimensions (H x W x D)	screw connection by means of 4 M6
Mounting	2 x connector 81-pole, locked, mechanical reverse polarity protection, type Tyco / AMP
Connection	contacts AMP-Junior-Timer, crimp connection 0.5/0.75/2.5 mm²
	2 x M12 connector 4 poles, D-coded
	2 x M12 connector 5 poles, A-coded
	Shield connection Ø 4 mm for self-tapping screw
	1.6 kg
Weight	– 40...85 °C (depending on the load) / – 40...85 °C
Housing/storage temperature	90 % (not condensing)
Max. perm. relative humidity	max. 3000 m
Height above sea level	IP 65 / IP 67 (for inserted connectors with individually sealed cores and inserted M12 connectors/sealing caps)
Protection rating	
Electrical data	
Input/output channels total	98 (60 inputs / 38 outputs)
Inputs	configurable, with diagnostic capability
	24 x A (0...10/32 V, 0...20 mA, ratiometric) / B_L
	16 x FRQ_{L/H} (≤ 30 kHz) / B_{L/H}
	4 x R (0.016...30 kOhm) / B_L
	8 x B_L (impedance ≤ 10 kOhm)
	8 x B_L (impedance ≤ 3.2 kOhm)
	configurable, with diagnostic capability
Outputs	8 x PWM_{H/L} / PWM_I / B_{H/L} (20...2000 Hz, 4.0 A, H-bridge)
	4 x PWM_H / PWM_I / B_H (20...2000 Hz, 4.0 A)
	12 x PWM_H / PWM_I / B_H (20...2000 Hz, 2.5 A)
	12 x PWM_H / B_H 2.5 A
	2 x A (0...10 V)
	1 x 5/10 V, max. 2 W configurable
Sensor supply	for the number of inputs/outputs and configuration options also see the wiring diagrams
	8...32 V $\overline{=}$
Operating voltage	36 V for t ≤ 10 s
Overvoltage	yes
Reverse polarity protection	max. 600 mA at 12 V
Current consumption VBB₃₀	max. 400 mA at 24 V

M30720	Technical data
CAN interfaces 0...3 Baud rate Communication protocol	CAN interface 2.0 A/B, ISO 11898 20 Kbits/s...1 Mbit/s (default 250 Kbits/s) CANopen, CiA DS 301 V4.2, CiA DS 401 V 1.4 SAE J 1939 / free protocol
Serial interface Baud rate Topology	RS-232 9.6...115.2 Kbits/s (default 115.2 Kbits/s) point-to-point (max. 2 participants); master-slave connection
Ethernet interface Transmission rate Protocols	1 interface with int. switch and 2 ports 10/100 Mbits/s TCP/IP, UDP/IP, Modbus UDP
Processor	32-bit TriCore CPU Infineon AURIX™
Device monitoring	overvoltage and undervoltage monitoring watchdog function check sum test for program and system excess temperature monitoring
Process monitoring concept	second switch-off way per output group via semiconductor switch
Physical memory	flash: 9 Mbytes RAM: 2.7 Mbytes remanent memory: 10 Kbytes
Memory allocation	see system manual www.ifm.com
Software/programming	
Programming system	CODESYS version 3.5 (IEC 61131-3)
Indicators	
Status LED	2 x two-colour LED (R/G) for SYS0 and SYS1
Ethernet LED	2 x LED (G) for ETH0 and ETH1
Application LED	4 x three-colour LED (R/G/B) for APP0, APP1, APP2 and APP3

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Operating states of the system

Operating states PLC / application

Technical data

LED SYS0		LED SYS1		System state
Colour	Status	Colour	Status	
–	off	–	off	no operating voltage
green	5 Hz	–	off	no operating system loaded
red	on	–	off	hardware error (fatal error+)
red	on	red	on	system error (fatal error)
green / yellow	2 Hz	green / yellow	2 Hz	update

LED	Co- lour	Status	Description	
SYS0	green	on	Standard PLC	no application
		2 Hz		run
	red	10 Hz		error application (serious error)
	yellow	2 Hz		debug run
		on		debug stop
SYS0	green	on	Safe PLC	no application
		2 Hz		run
	red	10 Hz		error application (serious error)
	yellow	2 Hz		debug run
		on		debug stop
ETH0	green	flashing	data transmission Ethernet	
		on	Ethernet connection OK, no data transfer	
ETH1	green	flashing	data transmission Ethernet	
		on	Ethernet connection OK, no data transfer	
APP0	red	on	status display of the application, freely program- mable	
...				
APP3	green	on	status display of the application, freely program- mable	
	blue	on	status display of the application, freely program- mable	

7.1.2 Test standards and regulations

M30720	Technical data	
Test standards and regulations		
CE marking	EN 61000-6-2	Electromagnetic compatibility (EMC) Noise immunity
E1 marking	EN 61000-6-4	Electromagnetic compatibility (EMC) Radiation of interference
Electrical tests	EN 61010	Safety requirements for electrical equipment for measurement, control and laboratory use
Climatic tests	UN/ECE-R10	Radiation of interference Immunity with 100 V/m
	ISO 7637-2	Pulse 1, severity level: IV; function state C Pulse 2a, severity level: IV; function state A Pulse 2b, severity level: IV; function state C Pulse 3a, severity level: IV; function state A Pulse 3b, severity level: IV; function state A Pulse 4, severity level: IV; function state A Pulse 5, severity level: III; function state A (data valid for the 24 V system) Pulse 4, severity level: III; function state A (data valid for the 12 V system)
	EN 60068-2-30	Damp heat, cyclic Upper temperature 55°C, number of cycles: 6
Mechanical tests	EN 60068-2-78	Damp heat, steady state Test temperature 40°C / 93% RH Test duration: 21 days
	EN 60068-2-52	Salt spray test Severity level 3 (vehicle)
	ISO 16750-3	Test VII; Vibration, random Mounting location: vehicle body
	EN 60068-2-6	Vibration, sinusoidal 10...500 Hz; 0.72 mm/10 g; 10 cycles/axis
	ISO 16750-3	Bump 30 g/6 ms; 24,000 shocks

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7.1.3 Connectors A and B / input characteristics

M30720		Connectors A and B / input characteristics	
Connector A:	Connector B:		
IN0100...0103	IN1100...1103		
IN0200...0203	IN1600...1603		
IN0600...0603			
IN0700...0703			
Multifunction inputs analogue / digital (IN MULTIFUNCTION-A)			
Current input 0...20 mA (A)		Resolution	12 bits
Voltage input 0...10 V (A)		Input frequency	< 330 Hz
Voltage input 0...32 V (A)		Accuracy	± 1% FS
Voltage input ratiometric (A)		Measuring ranges	0...10 V, 0...32 V, 0...20 mA, ratiometric, binary low side
Digital input (B _L)		Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break
		Input resistance	298 Ω
		Range diagnostics min - max.	0 mA / 20 mA (default)
		Input resistance	67.6 kΩ
		Range diagnostics min - max.	0 V / 10 V (default)
		Input resistance	51.0 kΩ
		Range diagnostics min - max.	0 V / 32 V (default)
		Input resistance	51.0 kΩ
		Range diagnostics min - max.	0 ‰ / 1000 ‰ (default)
		Input resistance	9.5 kΩ
		Switch-on level	> 0.7 VBB ₃₀
		Switch-off level	< 0.3 VBB ₃₀
		Range diagnostics min - max.	1 V / 0.95 VBB ₃₀ (default)
Connector A:	Connector B:	Resolution	12 bits
IN0000...0003	IN1000...1003		
IN0500...0503	IN1500...1503		
Digital inputs, frequency measurement (IN FREQUENCY-A)			
Frequency input (FRQ _{L/H})		Input resistance	10 kΩ
		Input frequency	≤ 30 kHz
		Switch-on level	> 0.7 VBB ₃₀
		Switch-off level	< 0.3 VBB ₃₀
		Accuracy	± 10 μs

M30720Digital input ($B_{L/H}$)**Connector A:****IN0400...0401****IN0900...0901****Digital/ resistor inputs
(IN RESISTOR-A)**Digital input (B_L)

Resistor input (R)

Connector B:**IN1200... 1203****IN1700... 1703****Digital inputs
(IN DIGITAL-A)**Digital input (B_L)**Connectors A and B / input characteristics**

Input resistance	10 k Ω
Input frequency	< 330 Hz
Switch-on level	> 0.7 $V_{BB_{30}}$
Switch-off level	< 0.3 $V_{BB_{30}}$
Accuracy $B_{L/H}$	$\pm 1 \%$
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to V_{BB} and short circuit to GND / wire break
Range diagnostics min - max.	1 V / 0.95 $V_{BB_{30}}$ (default)

Resolution	12 bits
Input frequency	< 330 Hz
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to V_{BB} and short circuit to GND / wire break

Input resistance	10 k Ω
Switch-on level	> 0.7 $V_{BB_{30}}$
Switch-off level	< 0.3 $V_{BB_{30}}$
Accuracy B_L	$\pm 1 \%$
Range diagnostics min - max.	1 V / 0.95 $V_{BB_{30}}$ (default)

Measuring current	< 2.0 mA
Measuring range	0.016...30 k Ω
Accuracy	$\pm 2\%$ FS: 0.016...3 k Ω $\pm 5\%$ FS: 3...15 k Ω $\pm 10\%$ FS: 15...30 k Ω
Range diagnostics min - max.	0 Ω / 31 k Ω (default)

Resolution	12 bits
Input frequency	< 330 Hz
Impedance	≤ 10 k Ω
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to V_{BB} and short circuit to GND / wire break

Input resistance	10 k Ω
Switch-on level	> 0.7 $V_{BB_{30}}$
Switch-off level	< 0.3 $V_{BB_{30}}$
Accuracy B_L	$\pm 1 \%$
Range diagnostics min - max.	1 V / 0.95 $V_{BB_{30}}$ (default)

UK

M30720

Connector A: **Connector B:**
IN0300... 0301 **IN1300... 1303**
IN0800... 0801

**Digital inputs 2-wire sensor
(IN DIGITAL-B)**

Digital input (B_L)

Abbreviations

Connectors A and B / input characteristics

Resolution	12 bits
Input frequency	< 330 Hz
Impedance	≤ 3.2 k Ω
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break

Input resistance	3.2 k Ω
Switch-on level	> 0.7 VBB ₃₀
Switch-off level	< 0.3 VBB ₃₀
Accuracy B _L	± 1 %
Range diagnostics min - max.	1 V / 0.95 VBB ₃₀ (default)

Observe the notes on the configuration of the inputs/outputs!
(Programming manual "ecomatController M30720")

A analogue
B_H binary high side (CSO)
B_L binary low side (CSI)
FRQ_{L/H} frequency/pulse inputs configurable low side (CSI) / high side (CSO)
PWM_H pulse-width modulation high side (CSO)
PWM_L pulse-width modulation low side (CSI)
PWM_i pulse-width modulation current-controlled
R resistance input
VBB_{0...3} supply output group via semiconductor switch
VBB₃₀ supply sensors/module

7.1.4 Connectors A and B / output characteristics

M30720		Connectors A and B / output characteristics	
Connector A:	Connector B:		
OUT0006...0007	OUT0306...0307		
OUT0106...0107			
OUT0206...0207			
Digital / PWM outputs 4.0 A, H-bridge (OUT PMW-40-BRIDGE-A)			
Digital output (B _H)		Switching current	0.025...4 A
		Protective circuit for inductive loads	integrated
		Accuracy current feedback	1 %
		Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
		Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND
Digital output (B _L)		Switching voltage	8...32 V $\overline{=}$
		Range diagnostics min - max.	0 A / 4 A (default)
PWM output (PWM _H)		Functions	as H-bridge
		Output frequency	20...2000 Hz (per channel)
		Pulse/pause ratio	1...1000 ‰ (adjustable via software)
		Resolution	1 ‰ (at 20...250 Hz)
		Range diagnostics min - max.	0 A / 4 A (default)
PWM output (PWM _L)		Output frequency	20...500 Hz (per channel)
		Pulse/pause ratio	1...1000 ‰ (adjustable via software)
		Resolution	1 ‰ (at 20...250 Hz)
Current-controlled output (PWM _I)		Output frequency	20...2000 Hz (per channel)
		Control range	0.05...4 A
		Setting resolution	1 mA
		Control resolution	2 mA
		Load resistance	≥ 3 Ω (at 12 V $\overline{=}$) ≥ 6 Ω (at 24 V $\overline{=}$)
		Accuracy	± 1.5 % FS (for inductive loads)
		Range diagnostics min - max.	0 A / 4 A (default)
Connector A:	Connector B:		
OUT0008	OUT0308		
OUT0108			
OUT0208			
Digital / PWM outputs 4.0 A (OUT PMW-40-A)		Switching voltage	8...32 V $\overline{=}$
		Switching current	0.025...4 A
		Protective circuit for inductive loads	integrated
		Accuracy current feedback	1 %
		Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
		Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND
Digital output (B _H)		Range diagnostics min - max.	0 A / 4 A (default)

UK

M30720PWM output (PWM_H)Current-controlled output (PWM_I)

Connector A: **Connector B:**

OUT0000 **OUT0300**
OUT0002 **OUT0302**
OUT0004 **OUT0304**
OUT0100
OUT0102
OUT0104
OUT0200
OUT0202
OUT0204

Digital / PWM outputs 2.5 A
(OUT PMW-25-A)

Digital output (B_H)PWM output (PWM_H)Current-controlled output (PWM_I)**Connectors A and B / output characteristics**

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ (at 20...250 Hz)
Range diagnostics min - max.	0 A / 4 A (default)

Output frequency	20...2000 Hz (per channel)
Control range	0.05...4 A
Setting resolution	1 mA
Control resolution	2 mA
Load resistance	≥ 3 Ω / (at 12 V $\overline{=}$) ≥ 6 Ω / (at 24 V $\overline{=}$)
Accuracy	± 1.5 % FS (for inductive loads)
Range diagnostics min - max.	0 A / 4 A (default)

Switching voltage	8...32 V $\overline{=}$
Switching current	0.025...2.5 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	1 %
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND

Range diagnostics min - max.	0 A / 2.5 A (default)
------------------------------	-----------------------

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ FS (at 20...250 Hz)
Range diagnostics min - max.	0 A / 2.5 A (default)

Output frequency	20...2000 Hz (per channel)
Control range	0.05...2.5 A
Setting resolution	1 mA (at 20...250 Hz)
Control resolution	2 mA
Load resistance	≥ 4.8 Ω / (at 12 V $\overline{=}$) ≥ 9.6 Ω / (at 24 V $\overline{=}$)
Accuracy	± 1.5 % FS (for inductive loads)
Range diagnostics min - max.	0 A / 2.5 A (default)

M30720**Connector A: Connector B:**

OUT0001 OUT0301
 OUT0003 OUT0303
 OUT0005 OUT0305
 OUT0101
 OUT0103
 OUT0105
 OUT0201
 OUT0203
 OUT0205

**Digital outputs 2.5 A
(OUT PMW-25-B)**Digital output (B_H)PWM output (PWM_H)**Connector A:****OUT3000****Sensor supply
(OUT SUPPLY-A)****Connector A: Connector B:**

OUT3001 OUT3002

**Analogue outputs
(OUT VOLTAGE-A)****Output groups VBB_{0...3}**

Load current per output group

Internal semiconductor switches

Short-circuit strength to GND

Abbreviations

Connectors A and B / output characteristics

Switching voltage	8...32 V $\overline{---}$
Switching current	0.025...2.5 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	5 %
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND

Range diagnostics min - max.	0 A / 2.5 A (default)
------------------------------	-----------------------

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ FS (at 20...250 Hz)
Range diagnostics min - max.	0 A / 2.5 A (default)

for sensors and joysticks
 5 V, 400 mA / 10 V, 200 mA, accuracy $\pm$ 5 %
 short-circuit proof and overload protected

Voltage range	8...32 V
Current rating	< 5 mA
Output voltage	0...10 V
Accuracy	$\pm$ 5 % FS

 $\leq$ 12 A

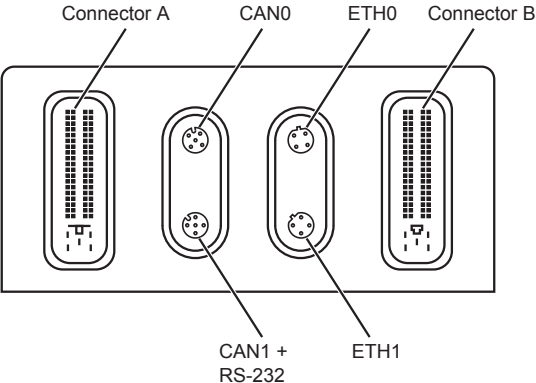
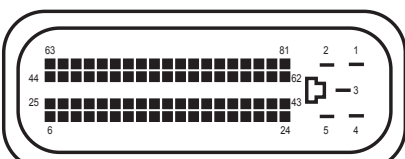
One switch in series of 9 semiconductor outputs each.
 Forced controlling by means of hardware
 and additional controlling by means of user program.

Switching current	0.1...12 A
Current diagnostics (excessive current)	> 12 A

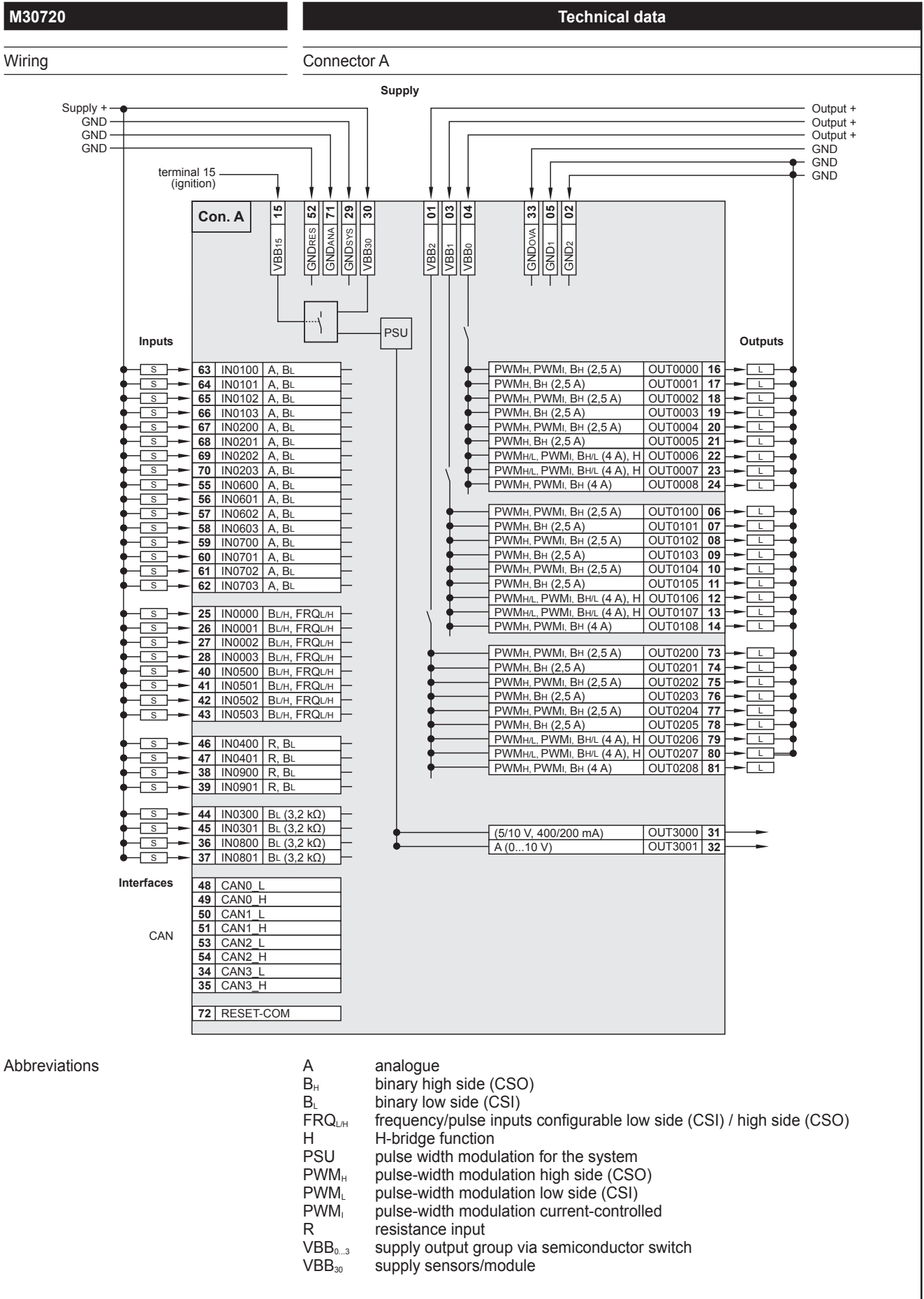
Switch-off of the outputs is carried out via the output driver

A analogue
 B_H binary high side (CSO)
 B_L binary low side (CSI)
 PWM_H pulse-width modulation high side (CSO)
 PWM_L pulse-width modulation low side (CSI)
 PWM_I pulse-width modulation current-controlled
 VBB_{0...3} supply output group via semiconductor switch
 VBB₃₀ supply sensors/module

7.1.5 Connectors

M30720	Technical data
Connectors	
CAN0	M12 socket, 5 poles, A-coded 1: not used: 2: not used: 3: CAN0_GND 4: CAN0_H 5: CAN0_L 
CAN1 + RS-232	M12 socket, 5 poles, A-coded 1: RS-232_TxD 2: RS-232_RxD 3: CAN1_GND 4: CAN1_H 5: CAN1_L 
ETH0 / ETH1	M12 socket, 4 poles, D-coded 1: TxD+ 2: RxD+ 3: TxD- 4: RxD- 
Connector A	AMP, 81-pole, A-coded 1-81: see wiring connector A 
Connector B	AMP, 81-pole, B-coded 1-81: see wiring connector B 

7.1.6 Connector A / wiring



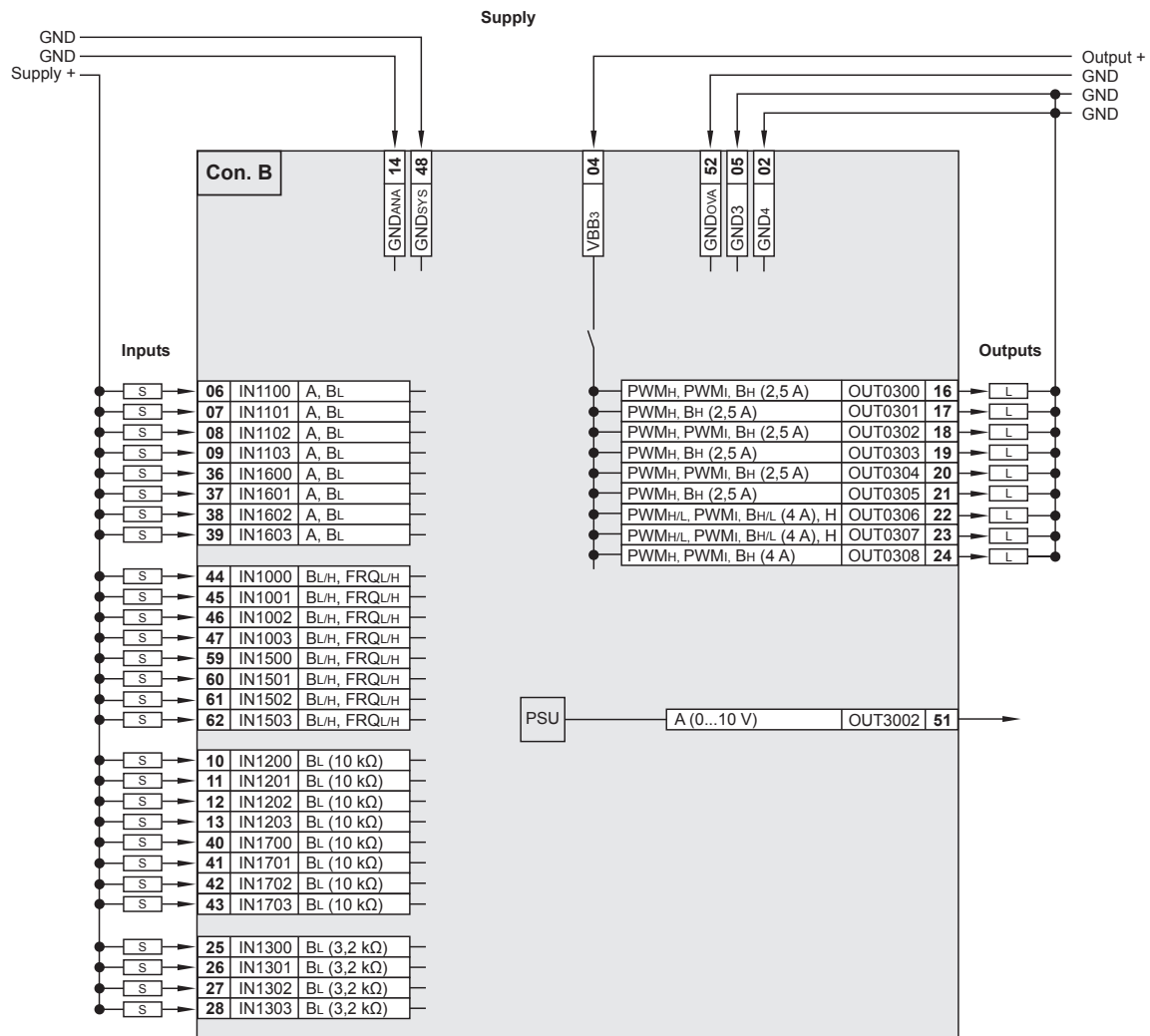
7.1.7 Connector B / wiring

M30720

Technical data

Wiring

Connector B

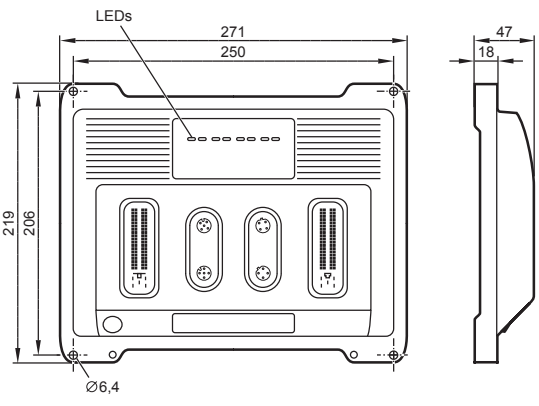


Abbreviations

A	analogue
B _H	binary high side (CSO)
B _L	binary low side (CSI)
FRQ _{L/H}	frequency/pulse inputs configurable low side (CSI) / high side (CSO)
H	H-bridge function
PSU	pulse width modulation for the system
PWM _H	pulse-width modulation high side (CSO)
PWM _L	pulse-width modulation low side (CSI)
PWM _i	pulse-width modulation current-controlled
R	resistance input
VBB _{0...3}	supply output group via semiconductor switch
VBB ₃₀	supply sensors/module

7.2 M30721

7.2.1 Mechanical and electric data

M30721 ecomatController/124 32-bit CPU TriCore processor 124 inputs/outputs 4 CAN interfaces Ethernet interface CODESYS 3.5 8...32 V $\overline{\text{---}}$	 
Technical data	Controller as black box system for the implementation of a central or decentralised system design
Mechanical data	
Housing	closed, screened metal housing with screw connection
Dimensions (H x W x D)	219 x 271 x 47 mm
Mounting	screw connection by means of 4 M6
Connection	2 x connector 81-pole, locked, mechanical reverse polarity protection, type Tyco / AMP contacts AMP-Junior-Timer, crimp connection 0.5/0.75/2.5 mm ² 2 x M12 connector 4 poles, D-coded 2 x M12 connector 5 poles, A-coded Shield connection Ø 4 mm for self-tapping screw
Weight	1.6 kg
Housing/storage temperature	– 40...85 °C (depending on the load) / – 40...85 °C
Max. perm. relative humidity	90 % (not condensing)
Height above sea level	max. 3000 m
Protection rating	IP 65 / IP 67 (for inserted connectors with individually sealed cores and inserted M12 connectors/sealing caps)
Electrical data	
Input/output channels total	124 (68 inputs / 56 outputs)
Inputs	configurable, with diagnostic capability 24 x A (0...10/32 V, 0...20 mA, ratiometric) / B _L 16 x FRQ _{L/H} (≤ 30 kHz) / B _{L/H} 4 x R (0.016...30 kOhm) / B _L 16 x B _L (impedance ≤ 10 kOhm) 8 x B _L (impedance ≤ 3.2 kOhm)
Outputs	configurable, with diagnostic capability 12 x PWM _{H/L} / PWM _I / B _{H/L} (20...2000 Hz, 4.0 A, H-bridge) 6 x PWM _H / PWM _I / B _H (20...2000 Hz, 4.0 A) 18 x PWM _H / PWM _I / B _H (20...2000 Hz, 2.5 A) 18 x PWM _H / B _H 2.5 A 2 x A (0...10 V)
Sensor supply	1 x 5/10 V, max. 2 W configurable
	for the number of inputs/outputs and configuration options also see the wiring diagrams
Operating voltage	8...32 V $\overline{\text{---}}$
Overvoltage	36 V for t ≤ 10 s
Reverse polarity protection	yes
Current consumption VBB ₃₀	max. 600 mA at 12 V max. 400 mA at 24 V

M30721	Technical data
CAN interfaces 0...3 Baud rate Communication protocol	CAN interface 2.0 A/B, ISO 11898 20 Kbits/s...1 Mbit/s (default 250 Kbits/s) CANopen, CiA DS 301 V4.2, CiA DS 401 V 1.4 SAE J 1939 / free protocol
Serial interface Baud rate Topology	RS-232 9.6...115.2 Kbits/s (default 115.2 Kbits/s) point-to-point (max. 2 participants); master-slave connection
Ethernet interface Transmission rate Protocols	1 interface with int. switch and 2 ports 10/100 Mbits/s TCP/IP, UDP/IP, Modbus UDP
Processor	32-bit TriCore CPU Infineon AURIX™
Device monitoring	overvoltage and undervoltage monitoring watchdog function check sum test for program and system excess temperature monitoring
Process monitoring concept	second switch-off way per output group via semiconductor switch
Physical memory	flash: 9 Mbytes RAM: 2.7 Mbytes remanent memory: 10 Kbytes
Memory allocation	see system manual www.ifm.com
Software/programming	
Programming system	CODESYS version 3.5 (IEC 61131-3)
Indicators	
Status LED	2 x two-colour LED (R/G) for SYS0 and SYS1
Ethernet LED	2 x LED (G) for ETH0 and ETH1
Application LED	4 x three-colour LED (R/G/B) for APP0, APP1, APP2 and APP3

M30721

Operating states of the system

Operating states PLC / application

Technical data

LED SYS0		LED SYS1		System state
Colour	Status	Colour	Status	
–	off	–	off	no operating voltage
green	5 Hz	–	off	no operating system loaded
red	on	–	off	hardware error (fatal error+)
red	on	red	on	system error (fatal error)
green / yellow	2 Hz	green / yellow	2 Hz	update

LED	Co- lour	Status	Description	
SYS0	green	on	Standard PLC	no application
		2 Hz		run
	red	10 Hz		error application (serious error)
	yellow	2 Hz		debug run
		on		debug stop
SYS0	green	on	Safe PLC	no application
		2 Hz		run
	red	10 Hz		error application (serious error)
	yellow	2 Hz		debug run
		on		debug stop
ETH0	green	flashing	data transmission Ethernet	
		on	Ethernet connection OK, no data transfer	
ETH1	green	flashing	data transmission Ethernet	
		on	Ethernet connection OK, no data transfer	
APP0	red	on	status display of the application, freely program- mable	
...				
APP3	green	on	status display of the application, freely program- mable	
	blue	on	status display of the application, freely program- mable	

UK

7.2.2 Test standards and regulations

M30721	Technical data	
Test standards and regulations		
CE marking	EN 61000-6-2	Electromagnetic compatibility (EMC) Noise immunity
E1 marking	EN 61000-6-4	Electromagnetic compatibility (EMC) Radiation of interference
Electrical tests	EN 61010	Safety requirements for electrical equipment for measurement, control and laboratory use
Climatic tests	UN/ECE-R10	Radiation of interference Immunity with 100 V/m
	ISO 7637-2	Pulse 1, severity level: IV; function state C Pulse 2a, severity level: IV; function state A Pulse 2b, severity level: IV; function state C Pulse 3a, severity level: IV; function state A Pulse 3b, severity level: IV; function state A Pulse 4, severity level: IV; function state A Pulse 5, severity level: III; function state A (data valid for the 24 V system) Pulse 4, severity level: III; function state A (data valid for the 12 V system)
	EN 60068-2-30	Damp heat, cyclic Upper temperature 55°C, number of cycles: 6
Mechanical tests	EN 60068-2-78	Damp heat, steady state Test temperature 40°C / 93% RH Test duration: 21 days
	EN 60068-2-52	Salt spray test Severity level 3 (vehicle)
	ISO 16750-3	Test VII; Vibration, random Mounting location: vehicle body
	EN 60068-2-6	Vibration, sinusoidal 10...500 Hz; 0.72 mm/10 g; 10 cycles/axis
	ISO 16750-3	Bump 30 g/6 ms; 24,000 shocks

7.2.3 Connectors A and B / input characteristics

M30721

Connector A: **Connector B:**
IN0100...0103 **IN1100...1103**
IN0200...0203 **IN1600...1603**
IN0600...0603
IN0700...0703

Multifunction inputs analogue / digital (IN MULTIFUNCTION-A)

Current input 0...20 mA (A)

Voltage input 0...10 V (A)

Voltage input 0...32 V (A)

Voltage input ratiometric (A)

Digital input (B_L)

Connector A: **Connector B:**
IN0000...0003 **IN1000...1003**
IN0500...0503 **IN1500...1503**

Digital inputs, frequency measurement (IN FREQUENCY-A)

Frequency input (FRQ_{L/H})

Connectors A and B / input characteristics

Resolution	12 bits
Input frequency	< 330 Hz
Accuracy	± 1% FS
Measuring ranges	0...10 V, 0...32 V, 0...20 mA, ratiometric, binary low side
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break

Input resistance	298 Ω
Range diagnostics min - max.	0 mA / 20 mA (default)

Input resistance	67.6 kΩ
Range diagnostics min - max.	0 V / 10 V (default)

Input resistance	51.0 kΩ
Range diagnostics min - max.	0 V / 32 V (default)

Input resistance	51.0 kΩ
Range diagnostics min - max.	0 ‰ / 1000 ‰ (default)

Input resistance	9.5 kΩ
Switch-on level	> 0.7 VBB ₃₀
Switch-off level	< 0.3 VBB ₃₀
Range diagnostics min - max.	1 V / 0.95 VBB ₃₀ (default)

Resolution	12 bits
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Input resistance	10 kΩ
Input frequency	≤ 30 kHz
Switch-on level	> 0.7 VBB ₃₀
Switch-off level	< 0.3 VBB ₃₀
Accuracy	± 10 μs

UK

M30721Digital input ($B_{L/H}$)**Connector A:****IN0400...0401****IN0900...0901****Digital/ resistor inputs
(IN RESISTOR-A)**Digital input (B_L)

Resistor input (R)

Connector B:**IN1200... 1203****IN1400... 1403****IN1700... 1703****IN1800... 1803****Digital inputs
(IN DIGITAL-A)**Digital input (B_L)**Connectors A and B / input characteristics**

Input resistance	10 k Ω
Input frequency	< 330 Hz
Switch-on level	> 0.7 VBB ₃₀
Switch-off level	< 0.3 VBB ₃₀
Accuracy $B_{L/H}$	$\pm 1 \%$
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break
Range diagnostics min - max.	1 V / 0.95 VBB ₃₀ (default)

Resolution	12 bits
Input frequency	< 330 Hz
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break

Input resistance	10 k Ω
Switch-on level	> 0.7 VBB ₃₀
Switch-off level	< 0.3 VBB ₃₀
Accuracy B_L	$\pm 1 \%$
Range diagnostics min - max.	1 V / 0.95 VBB ₃₀ (default)

Measuring current	< 2.0 mA
Measuring range	0.016...30 k Ω
Accuracy	$\pm 2\%$ FS: 0.016...3 k Ω $\pm 5\%$ FS: 3...15 k Ω $\pm 10\%$ FS: 15...30 k Ω
Range diagnostics min - max.	0 Ω / 31 k Ω (default)

Resolution	12 bits
Input frequency	< 330 Hz
Impedance	≤ 10 k Ω
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break

Input resistance	10 k Ω
Switch-on level	> 0.7 VBB ₃₀
Switch-off level	< 0.3 VBB ₃₀
Accuracy B_L	$\pm 1 \%$
Range diagnostics min - max.	1 V / 0.95 VBB ₃₀ (default)

M30721	
Connector A:	Connector B:
IN0300... 0301	IN1300... 1303
IN0800... 0801	
Digital inputs 2-wire sensor (IN DIGITAL-B)	
Digital input (B _L)	
Abbreviations	

Connectors A and B / input characteristics	
Resolution	12 bits
Input frequency	< 330 Hz
Impedance	≤ 3.2 k Ω
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break
Input resistance	3.2 k Ω
Switch-on level	> 0.7 VBB ₃₀
Switch-off level	< 0.3 VBB ₃₀
Accuracy B _L	± 1 %
Range diagnostics min - max.	1 V / 0.95 VBB ₃₀ (default)
Observe the notes on the configuration of the inputs/outputs! (Programming manual "ecomatController M30721")	
A analogue B _H binary high side (CSO) B _L binary low side (CSI) FRQ _{L/H} frequency/pulse inputs configurable low side (CSI) / high side (CSO) PWM _H pulse-width modulation high side (CSO) PWM _L pulse-width modulation low side (CSI) PWM _i pulse-width modulation current-controlled R resistance input VBB _{0...5} supply output group via semiconductor switch VBB ₃₀ supply sensors/module	

7.2.4 Connectors A and B / output characteristics

M30721		Connectors A and B / output characteristics	
Connector A:	Connector B:	Switching current	0.025...4 A
OUT0006...0007	OUT0306...0307	Protective circuit for inductive loads	integrated
OUT0106...0107	OUT0406...0407	Accuracy current feedback	1 %
OUT0206...0207	OUT0506...0507	Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Digital / PWM outputs 4.0 A, H-bridge (OUT PMW-40-BRIDGE-A)		Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND
Digital output (B _H)		Switching voltage	8...32 V $\overline{\text{---}}$
Digital output (B _L)		Range diagnostics min - max.	0 A / 4 A (default)
PWM output (PWM _H)		Functions	as H-bridge
PWM output (PWM _L)		Output frequency	20...2000 Hz (per channel)
Current-controlled output (PWM _I)		Pulse/pause ratio	1...1000 ‰ (adjustable via software)
		Resolution	1 ‰ (at 20...250 Hz)
		Range diagnostics min - max.	0 A / 4 A (default)
		Output frequency	20...500 Hz (per channel)
		Pulse/pause ratio	1...1000 ‰ (adjustable via software)
		Resolution	1 ‰ (at 20...250 Hz)
		Output frequency	20...2000 Hz (per channel)
		Control range	0.05...4 A
		Setting resolution	1 mA
		Control resolution	2 mA
		Load resistance	≥ 3 Ω (at 12 V $\overline{\text{---}}$) ≥ 6 Ω (at 24 V $\overline{\text{---}}$)
		Accuracy	± 1.5 % FS (for inductive loads)
		Range diagnostics min - max.	0 A / 4 A (default)
Connector A:	Connector B:	Switching voltage	8...32 V $\overline{\text{---}}$
OUT0008	OUT0308	Switching current	0.025...4 A
OUT0108	OUT0408	Protective circuit for inductive loads	integrated
OUT0208	OUT0508	Accuracy current feedback	1 %
Digital / PWM outputs 4.0 A (OUT PMW-40-A)		Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Digital output (B _H)		Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND
		Range diagnostics min - max.	0 A / 4 A (default)

M30721PWM output (PWM_H)Current-controlled output (PWM_I)**Connector A: Connector B:**

OUT0000 OUT0300
OUT0002 OUT0302
OUT0004 OUT0304
OUT0100 OUT0400
OUT0102 OUT0402
OUT0104 OUT0404
OUT0200 OUT0500
OUT0202 OUT0502
OUT0204 OUT0504

Digital / PWM outputs 2.5 A
(OUT PMW-25-A)

Digital output (B_H)PWM output (PWM_H)Current-controlled output (PWM_I)**Connectors A and B / output characteristics**

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ (at 20...250 Hz)
Range diagnostics min - max.	0 A / 4 A (default)

Output frequency	20...2000 Hz (per channel)
Control range	0.05...4 A
Setting resolution	1 mA
Control resolution	2 mA
Load resistance	≥ 3 Ω / (at 12 V $\overline{---}$) ≥ 6 Ω / (at 24 V $\overline{---}$)
Accuracy	± 1.5 % FS (for inductive loads)
Range diagnostics min - max.	0 A / 4 A (default)

Switching voltage	8...32 V $\overline{---}$
Switching current	0.025...2.5 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	1 %
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND

Range diagnostics min - max.	0 A / 2.5 A (default)
------------------------------	-----------------------

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ FS (at 20...250 Hz)
Range diagnostics min - max.	0 A / 2.5 A (default)

Output frequency	20...2000 Hz (per channel)
Control range	0.05...2.5 A
Setting resolution	1 mA (at 20...250 Hz)
Control resolution	2 mA
Load resistance	≥ 4.8 Ω / (at 12 V $\overline{---}$) ≥ 9.6 Ω / (at 24 V $\overline{---}$)
Accuracy	± 1.5 % FS (for inductive loads)
Range diagnostics min - max.	0 A / 2.5 A (default)

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M30721**Connector A: Connector B:**

OUT0001 OUT0301
OUT0003 OUT0303
OUT0005 OUT0305
OUT0101 OUT0401
OUT0103 OUT0403
OUT0105 OUT0405
OUT0201 OUT0501
OUT0203 OUT0503
OUT0205 OUT0505

Digital outputs 2.5 A
(OUT PMW-25-B)
Digital output (B_H)PWM output (PWM_H)**Connector A:****OUT3000**
Sensor supply
(OUT SUPPLY-A)
Connector A: Connector B:

OUT3001 OUT3002

Analogue outputs
(OUT VOLTAGE-A)
Output groups VBB_{0...5}

Load current per output group

Internal semiconductor switches

Short-circuit strength to GND

Abbreviations

Connectors A and B / output characteristics

Switching voltage	8...32 V $\overline{=}$
Switching current	0.025...2.5 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	5 %
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND

Range diagnostics min - max.	0 A / 2.5 A (default)
------------------------------	-----------------------

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ FS (at 20...250 Hz)
Range diagnostics min - max.	0 A / 2.5 A (default)

for sensors and joysticks
 5 V, 400 mA / 10 V, 200 mA, accuracy $\pm$ 5 %
 short-circuit proof and overload protected

Voltage range	8...32 V
Current rating	< 5 mA
Output voltage	0...10 V
Accuracy	$\pm$ 5 % FS

 $\leq$ 12 A

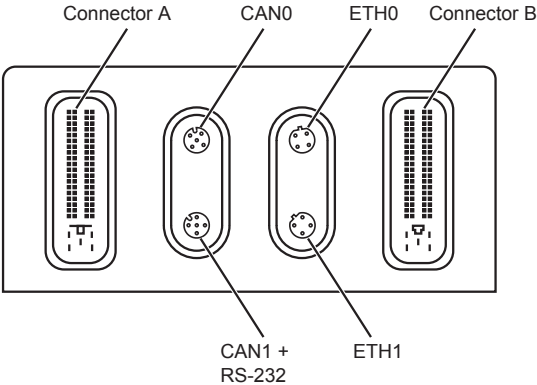
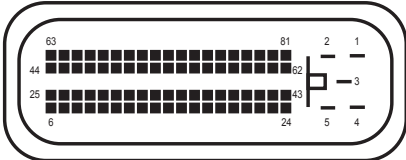
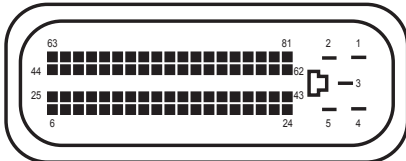
One switch in series of 9 semiconductor outputs each.
 Forced controlling by means of hardware
 and additional controlling by means of user program.

Switching current	0.1...12 A
Current diagnostics (excessive current)	> 12 A

Switch-off of the outputs is carried out via the output driver

A analogue
 B_H binary high side (CSO)
 B_L binary low side (CSI)
 PWM_H pulse-width modulation high side (CSO)
 PWM_L pulse-width modulation low side (CSI)
 PWM_I pulse-width modulation current-controlled
 VBB_{0...5} supply output group via semiconductor switch
 VBB₃₀ supply sensors/module

7.2.5 Connectors

M30721	Technical data	
Connectors		
CAN0	M12 socket, 5 poles, A-coded 1: not used: 2: not used: 3: CAN0_GND 4: CAN0_H 5: CAN0_L	
CAN1 + RS-232	M12 socket, 5 poles, A-coded 1: RS-232_TxD 2: RS-232_RxD 3: CAN1_GND 4: CAN1_H 5: CAN1_L	
ETH0 / ETH1	M12 socket, 4 poles, D-coded 1: TxD+ 2: RxD+ 3: TxD- 4: RxD-	
Connector A	AMP, 81-pole, A-coded 1-81: see wiring connector A	
Connector B	AMP, 81-pole, B-coded 1-81: see wiring connector B	

UK

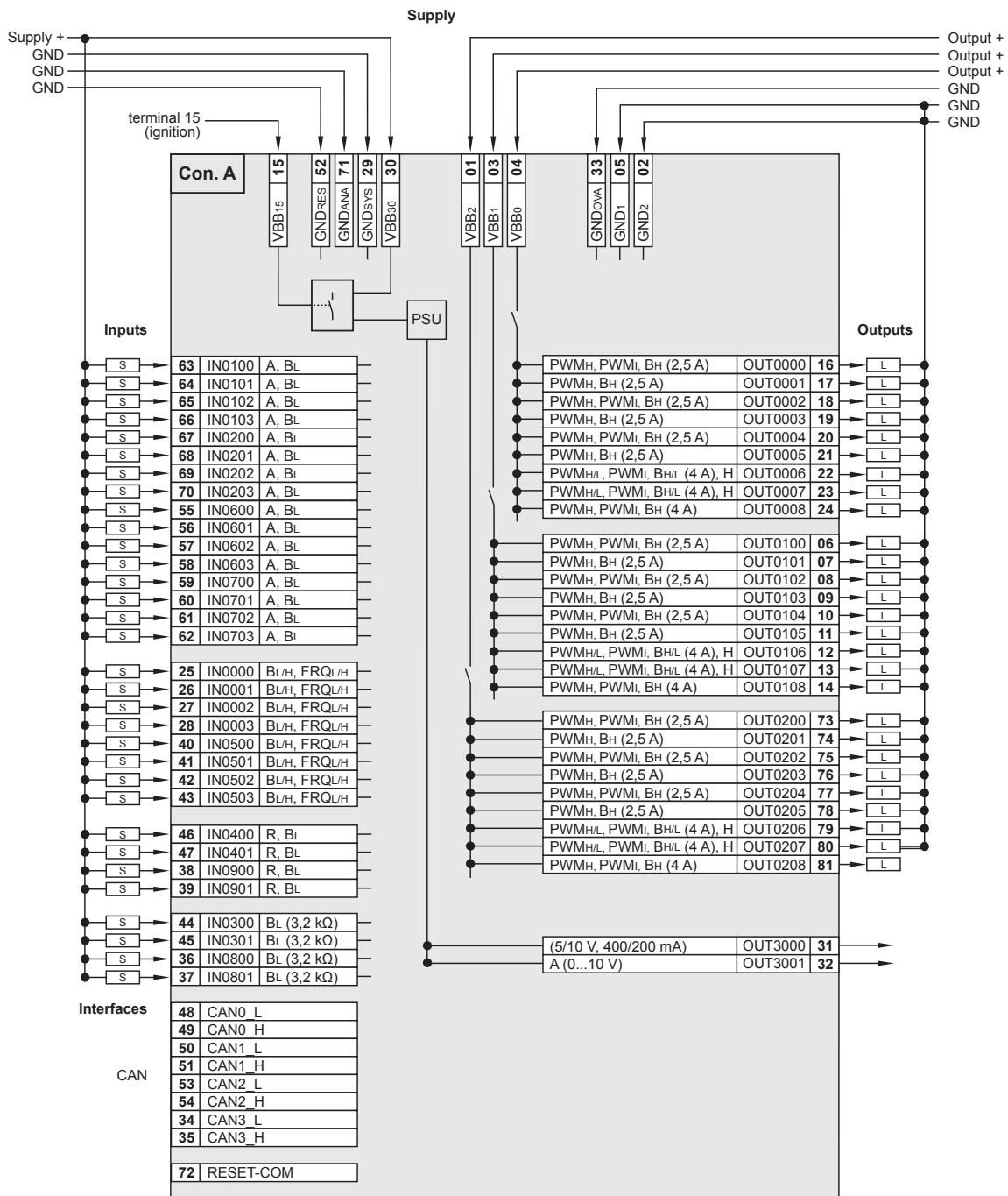
7.2.6 Connector A / wiring

M30721

Technical data

Wiring

Connector A



Abbreviations

A	analogue
B _H	binary high side (CSO)
B _L	binary low side (CSI)
FRQ _{L/H}	frequency/pulse inputs configurable low side (CSI) / high side (CSO)
H	H-bridge function
PSU	pulse width modulation for the system
PWM _H	pulse-width modulation high side (CSO)
PWM _L	pulse-width modulation low side (CSI)
PWM _i	pulse-width modulation current-controlled
R	resistance input
VBB _{0...5}	supply output group via semiconductor switch
VBB ₃₀	supply sensors/module

8 Maintenance, repair and disposal

The unit is maintenance-free.

- ▶ Do not open the housing as the device does not contain any components which can be maintained by the user. The device must only be repaired by the manufacturer.
- ▶ Dispose of the device in accordance with the national environmental regulations.

9 Approvals/standards

Test standards and regulations (→ 7 Technical data)

The EC declaration of conformity and approvals can be found at:
www.ifm.com → Search → Art. no. → Documents & downloads