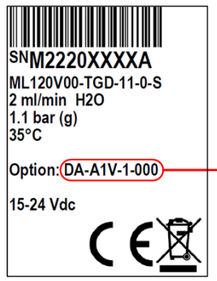
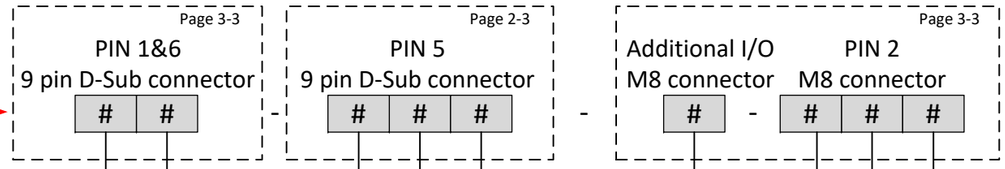
Hook-up diagram laboratory-style Optional bus and IO configuration



The label shown is for illustration purposes only and may vary on actual products.



Controller mode	Code
Controller disabled (meter only)	0
Controller enabled, analog setpoint	A
Controller enabled, digital setpoint	D

Integrated Comm. Mode	Code
RS232 – ProPar (default)	A
RS485 – FLOW-BUS	B
RS485 – Modbus RTU	C
RS485 – Modbus ASCII	D

Code	Type	Code	Range	Code	Linked parameter
0	Disabled	0	0 Vdc	0	-
A	Voltage output	0	0-5 Vdc	A	Alarm
		1	0-10 Vdc	B	Batch counter
		9	Custom	C	Control mode
B	Current output	0	0-20 mAdc	D	Density
		1	4-20 mAdc	E	Measure
		2	3.8-20.8 mAdc	F	Frequency
		9	Custom	I	IO switch status
C	Digital output	0	Remote parameter	P	Pressure
		1	Min alarm	S	Setpoint
		2	Max alarm	T	Temperature
		3	Min/max alarm	V	Controller output
		4	Counter limit reached	Z	Custom
		5	Enabled by:		
		9	Custom		
D	Frequency output	9	Custom		
E	PWM output	9	Custom		
F	Pulse output	9	Custom		
G	Voltage input * only on Pin 5	0	0-5 Vdc	C	Control mode
		1	0-10 Vdc	E	Measure (external sensor)
		9	Custom	I	IO switch status
H	Current input * only on Pin 5	0	0-20 mAdc	N	Calibration mode
		1	4-20 mAdc	R	Reset
		9	Custom	S	Setpoint
I	Digital input	1	Counter reset	V	Actuator (Valve)
		2	Alarm reset	Z	Custom
		3	Close Valve		
		4	Counter reset/disable		
		5	Auto Zero		
		8	Purge Valve		
		9	Custom		

Code	Additional I/O connector (M8)
1	Enabled, Bronkhorst valve output (default)

Preset Table

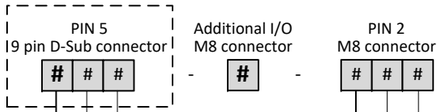
Type	Range	Par	Configurable input/output (PIN 5 D-Sub / PIN 2 M8)
0	0	0	Disabled, 0 Vdc (default)
A	1	V	0-10 Vdc output, controller
B	1	V	4-20 mAdc output, controller
B	2	V	3.8-20.8 mAdc output (TEIP11/Badger), controller
C	3	A	Digital output, min/max alarm
C	4	A	Digital output, counter limit reached
C	5	S	Digital output, enabled by setpoint (for shut-off)
C	0	I	Digital output, high/low switch via remote parameter
D	9	E	Digital frequency output, measure
F	9	B	Digital pulse output, batch counter
I	3	C	Digital input, controller mode valve close
I	8	C	Digital input, controller mode valve purge
I	1	R	Digital input, reset counter
I	2	R	Digital input, reset alarm

Other settings on request.

Check next page for Hook-up diagrams

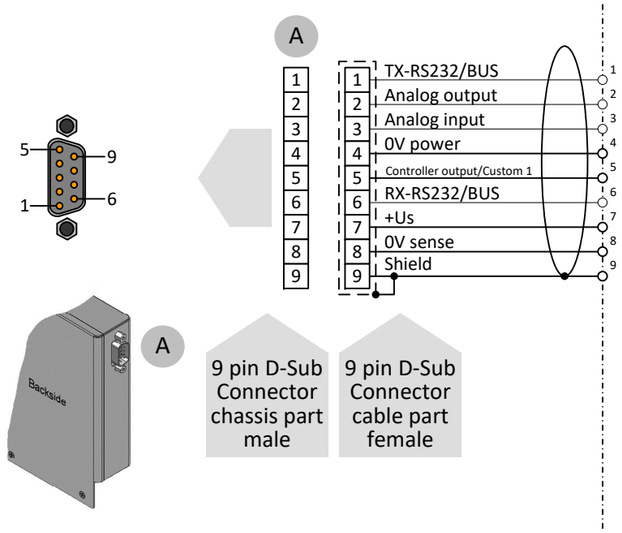
PIN 5, IO HOOK-UP DIAGRAMS

IO OPTIONS PIN 5 9 pin D-Sub / PIN 2 M8



0	0	0	Disabled, 0 Vdc (default)
A	#	#	Vdc analog output
B	#	#	mAdc analog output
C	#	#	Digital output
D	#	#	Digital frequency output
E	#	#	Digital PWM output
F	#	#	Digital pulse output
G	#	#	Vdc analog input * only on Pin 5
H	#	#	mAdc analog input * only on Pin 5
I	#	#	Digital input

PIN CONNECTIONS 9 pin D-Sub

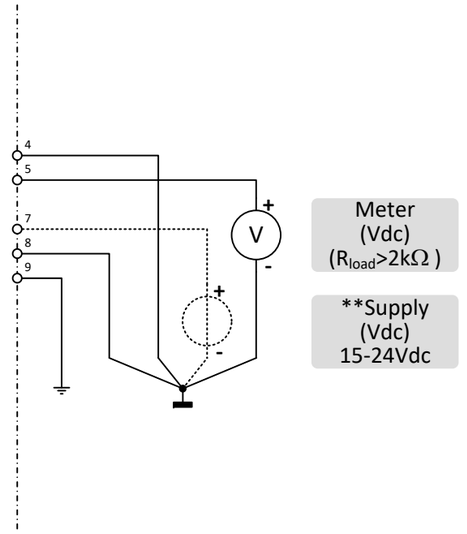


When connecting the system to other devices, be sure that the integrity of the shielding is not affected. Do not use unshielded wire terminals.

** POWER SUPPLY WARNING

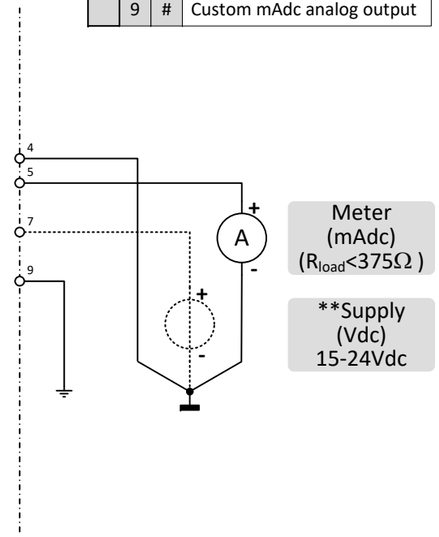
Use only SUB-D 9 or FLOW-BUS/Modbus/DeviceNet connector to power the device. Wrong powering could damage the device. Please refer the corresponding manual for the right power connection!

A			
	0	#	0-5 Vdc analog output
	1	#	0-10 Vdc analog output
	9	#	custom Vdc analog output



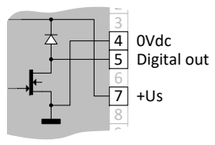
Note:
0V power (PIN 4) and 0V sense (PIN 8) should be seperately connected to the 0Vdc terminal at the power supply for long cable compensation

B			
	0	#	0-20 mAdc analog output
	1	#	4-20 mAdc analog output
	2	#	3.8-20.8 mAdc output
	9	#	Custom mAdc analog output

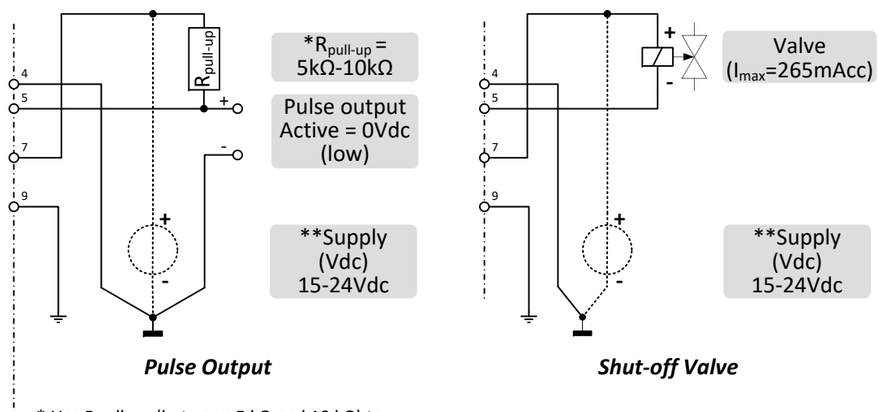


Note:
In analog mode with 'mAdc' signals 0V sense (PIN 8) does not need to be connected. The instrument's operation will not be effected in case 0Vdc sense is already hooked-up.

Internal setup digital output



C	#	#	Digital output
D	#	#	Digital frequency output
E	#	#	Digital PWM output
F	#	#	Digital pulse output

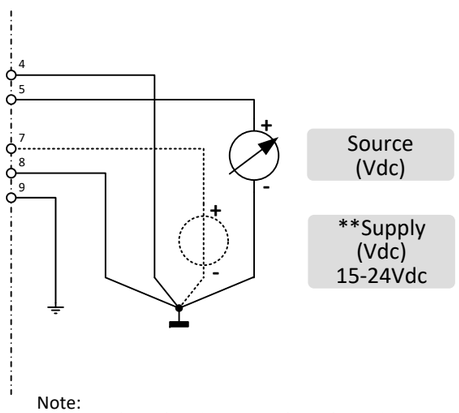


Pulse Output ***Shut-off Valve***

* Use Rpull-up (between 5 kΩ and 10 kΩ) to create 15-24Vdc at PIN 5.

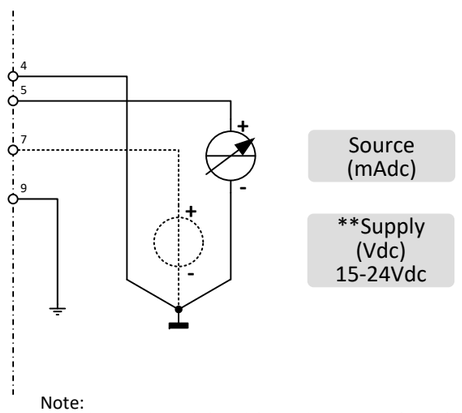
Note: **
For 15Vdc supply the minimal Load is 60 Ω, for 24Vdc supply the minimal load is 90 Ω.

G			
	0	#	0-5 Vdc analog input
	1	#	0-10 Vdc analog input
	9	#	custom Vdc analog input



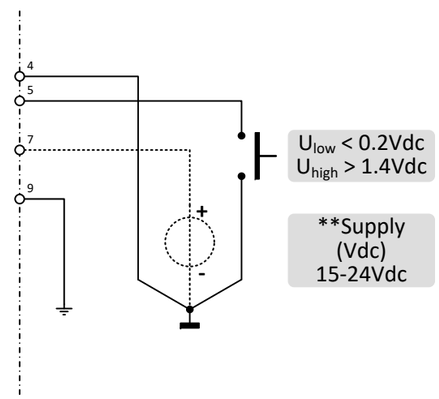
Note:
0V power (PIN 4) and 0V sense (PIN 8) should be seperatly connected to the 0Vdc terminal at the power supply. (Impedance = 250kΩ)

H			
	0	#	0-20 mAdc analog input
	1	#	4-20 mAdc analog input
	9	#	custom mAdc analog input



Note:
In analog mode with 'mAdc' signals 0V sense (PIN 8) does not need to be connected. The instrument's operation will not be effected in case 0Vdc sense is already hooked-up. (Impedance = 250Ω)

I	#	#	Digital input



Bronkhorst®

doc.no.: 9.16.131F

date: 20-09-2022

Hook-up diagram laboratory-style Optional bus and IO configuration

MBC3 Hook-up diagram
ML Series instruments

PIN 1&6, RS232/RS485 HOOK-UP DIAGRAMS

PIN 1&6 BUS OPTIONS

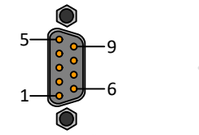
PIN 1&6 9 pin D-Sub connector		-	PIN 5 9 pin D-Sub connector			-	Additional I/O M8 connector	-	PIN 2 M8 connector		
#	#	-	#	#	#	-	#	-	#	#	#

A	RS232 – ProPar (default)
B	RS485 – FLOW-BUS
C	RS485 – Modbus RTU
D	RS485 – Modbus ASCII

0	Controller disabled (meter only)
A	Analog setpoint mode
D	Digital setpoint mode

Note:
When the instrument is configured for analog sepoint mode it is not possible to give a setpoint via FLOW-BUS or Modbus input on the 9 pin D-Sub connector.
To configure the instrument for digital operation, change parameter 'control mode'. See doc.nr. 9.17.023 for more details.

PIN CONNECTIONS 9 pin D-Sub



A

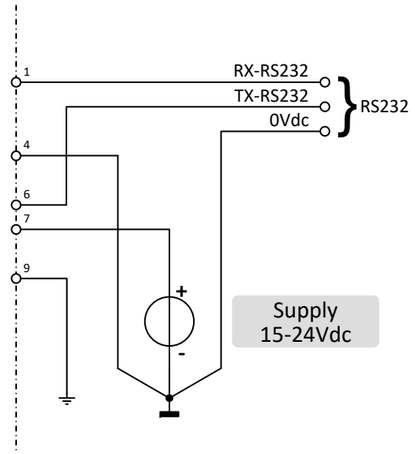
A		
1	1	TX-RS232/BUS
2	2	Analog output
3	3	Analog input
4	4	0V power
5	5	Controller output/Custom 1
6	6	RX-RS232/BUS
7	7	+Us
8	8	0V sense
9	9	Shield

9 pin D-Sub Connector chassis part male

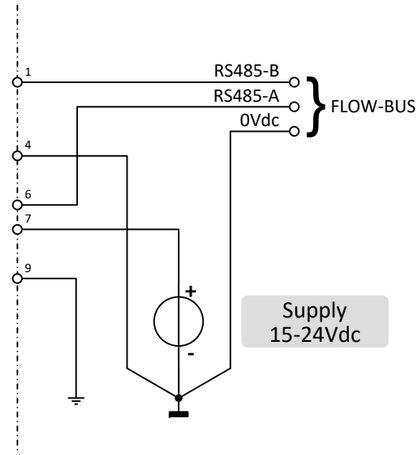
9 pin D-Sub Connector cable part female

When connecting the system to other devices, be sure that the integrity of the shielding is not affected. Do not use unshielded wire terminals.

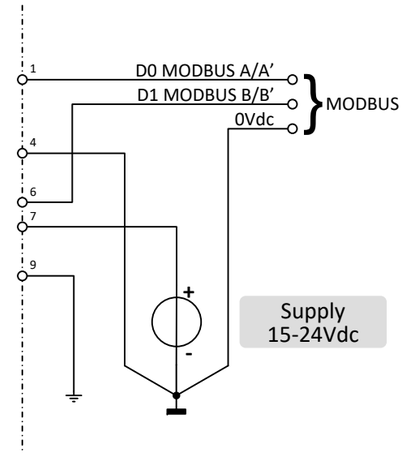
#	A	RS232 – ProPar (default)



#	B	RS485 – FLOW-BUS



#	C	RS485 – Modbus RTU
#	D	RS485 – Modbus ASCII



Additional actuator connector, HOOK-UP DIAGRAMS

actuator PIN CONNECTIONS M8

PIN 5 9 pin D-Sub connector			-	Additional I/O M8 connector	-	PIN 2 M8 connector		
#	#	#	-	#	-	#	#	#

4p M8 connector chassis part female

B

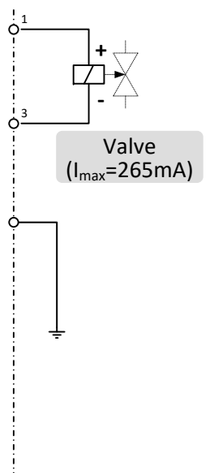
B		
1	1	+Us out
2	2	Custom 2
3	3	Valve out
4	4	0V power
	Shield	

4 pin M8 connector chassis part female

4 pin M8 connector cable part male

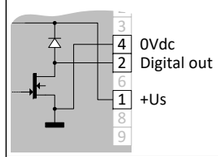
When connecting the system to other devices, be sure that the integrity of the shielding is not affected. Do not use unshielded wire terminals.

Bronkhorst (proportional) valve connection

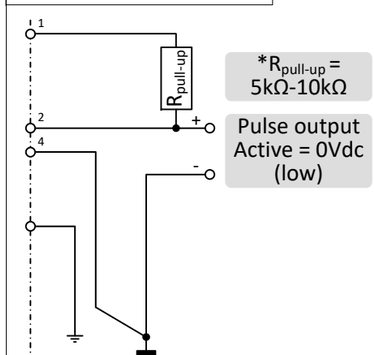


Valve (I_{max}=265mA)

Internal setup digital output



C	#	#	Digital output
D	#	#	Digital frequency output
E	#	#	Digital PWM output
F	#	#	Digital pulse output

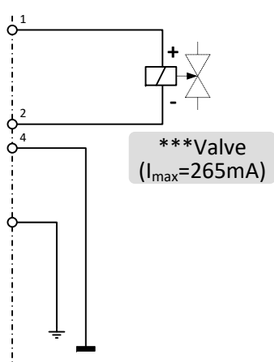


*$R_{pull-up}$ = 5kΩ-10kΩ

Pulse output Active = 0Vdc (low)

Pulse Output

Note: *
Use Rpull-up (between 5kΩ and 10 kΩ) to create 15-24Vdc at PIN 5

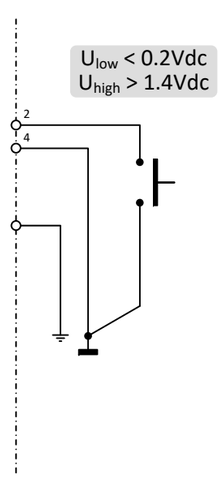


***Valve (I_{max}=265mA)

Shut-off Valve

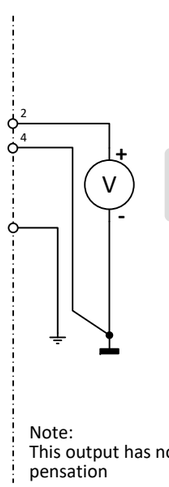
Note: ***
For 15Vdc supply the minimal Load is 60 Ω, for 24Vdc supply the minimal load is 90 Ω

I	#	#	Digital input



U_{low} < 0.2Vdc
U_{high} > 1.4Vdc

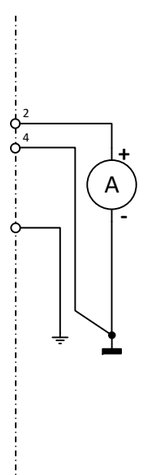
A	0	#	0-5 Vdc analog output
	1	#	0-10 Vdc analog output
	9	#	custom Vdc analog output



Meter (Vdc) (R_{load}>2kΩ)

Note:
This output has no long cable compensation

B	0	#	0-20 mAdc analog output
	1	#	4-20 mAdc analog output
	2	#	3.8-20.8 mAdc output
	9	#	Custom mAdc analog output



Meter (mAdc) (R_{load}<375Ω)