

iM.60



GB MANUAL

NL HANDLEIDING

DE ANLEITUNG

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This manual has been compiled with the utmost care. If, however, you should discover an error, please inform Fancom B.V.

Art.Nr. 35911713

GB140401

Table of contents

1.	General introduction	1
1.1	Fancom helpdesk	1
1.2	How to use this manual	1
1.3	Safety instructions and warnings	1
2.	Installing the iM.60.....	2
2.1	Placing the iM.60	2
2.2	Mounting the coercion roller	3
2.3	Mounting the steel cable on the coercion roller	4
2.4	Mounting the strap drum and strap	4
2.5	Mounting the pipe chain drive (optional).....	5
2.6	Mounting the CE cover	5
2.7	Connecting the iM.60.....	5
2.8	Testing the iM.60	7
3.	Using the iM.60	8
3.1	Setting the switch	8
3.2	Remote manual operation	8
4.	Adjusting the iM.60.....	9
4.1	Adjusting limit switches.....	11
4.2	Adjusting the CLOSED position.....	13
4.3	Adjusting the OPEN position	13
4.4	Adjusting the PREDEFINED position.....	14
4.5	Completing adjustments	14
5.	Extra possibilities	15
5.1	Using the emergency battery (optional).....	15
5.2	Predefined position / adjusting independently	15
5.3	Reversing the direction of rotation	16
5.4	Connecting the maximum thermostat	16
6.	Alarms	17
7.	Technical specifications	18
8.	Appendix: connection diagram	20
9.	EG declaration of conformity.....	21

1. General introduction

This manual has been compiled with the utmost care. If, however, you should discover an error, please inform Fancom B.V.

1.1 Fancom helpdesk

For any questions and support, please contact the local Fancom Sales & Service Center.

1.2 How to use this manual

The following symbols are used in this manual:



Tips and suggestions.



Note providing recommendations and additional information.



Warning indicating damage to the product if you do not follow procedures carefully.



Warning indicating danger to humans or animals.



Electrical shock hazard. Danger to humans and animals.



Example of a practical application of the described functionality.



Calculation example.

1.3 Safety instructions and warnings

Before installing and commissioning the iM.60, read the safety instructions, provisions and conditions carefully. This paragraph contains a number of general safety instructions. The installation of the device and remedying of any malfunctions should be performed by a certified electrical installer according to the applicable norms. The guarantee does not apply if this product is installed in any other way than is indicated by Fancom and if the product's motor has been opened and changes have been made to the product.



Prevent electrostatic discharge (ESD) when working on the iM.60. Ensure that the workplace is clean and dry.



Check the iM.60 for proper functioning regularly.



Never install a damaged iM.60! Notify your supplier of any damages.







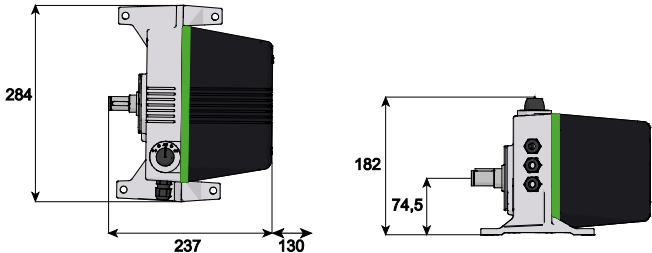
Do not touch any of the iM.60 moving parts.

2. Installing the iM.60

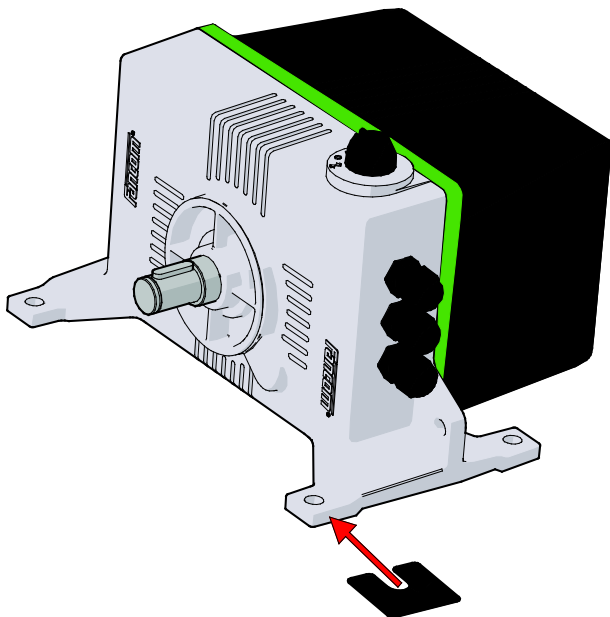
Install the iM.60 and associated components as follows:

1. Place the iM.60 (see page 2)
2. Mount the coercion roller (see page 3)
3. Mount the steel cable on the coercion roller (see page 3)
4. Mount the strap drum and strap (see page 4)
5. Mount the pipe chain drive (optional) (see page 4)
6. Mount the CE cover (see page 5)
7. Connect the iM.60 (see page 5)
8. Test the iM.60 (see page 7)

2.1 Placing the iM.60

	Never place the iM.60 in a place where the weather has direct influence (not in the sun, not in places where the temperature can rise sharply etc.).
	Place the iM.60 at such a height that the manual control can be used.
	Do not place the iM.60 with the driveshaft pointing upwards. This keeps water from entering the motor via the drive shaft. If you do place the iM.60 with the driveshaft pointing upwards, then mount the CE cover on the shaft.
	

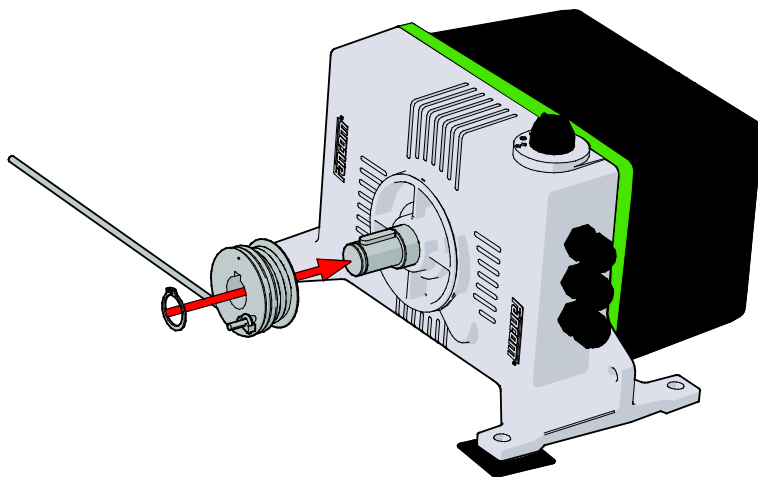
1. Drill holes in the floor surface. For this, you can use the included drill template. Ensure at least 130 mm of free space behind the iM.60. This is the space required to disassemble the cover.
2. Place the iM.60 on a flat subsurface with the screw fittings on the bottom.



If the iM.60 cannot be placed on a flat subsurface, you can use the included shims (0.5 mm and 1.0 mm thickness).

3. Seal the screw fittings with grout to prevent penetration of moisture, dust and/or corrosive gases.

2.2 Mounting the coercion roller

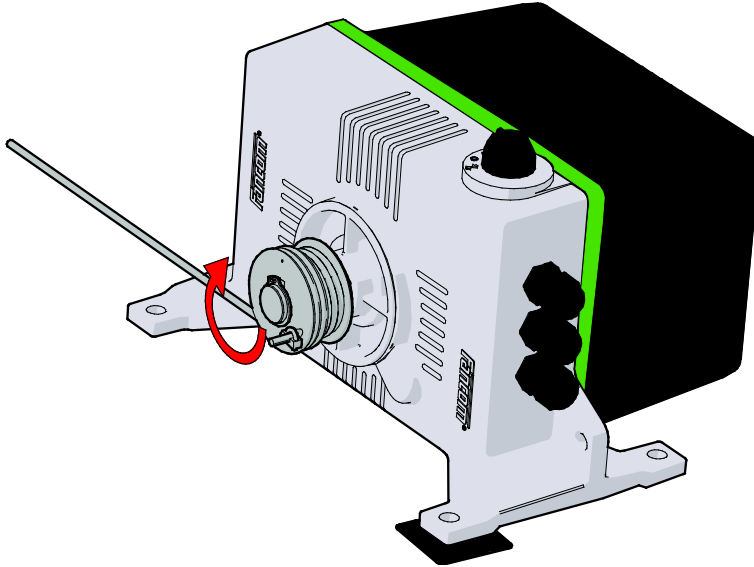


2.3 Mounting the steel cable on the coercion roller



Ensure that you have the steel cable on the correct side and that you have the proper direction of rotation for coiling up the steel cable.

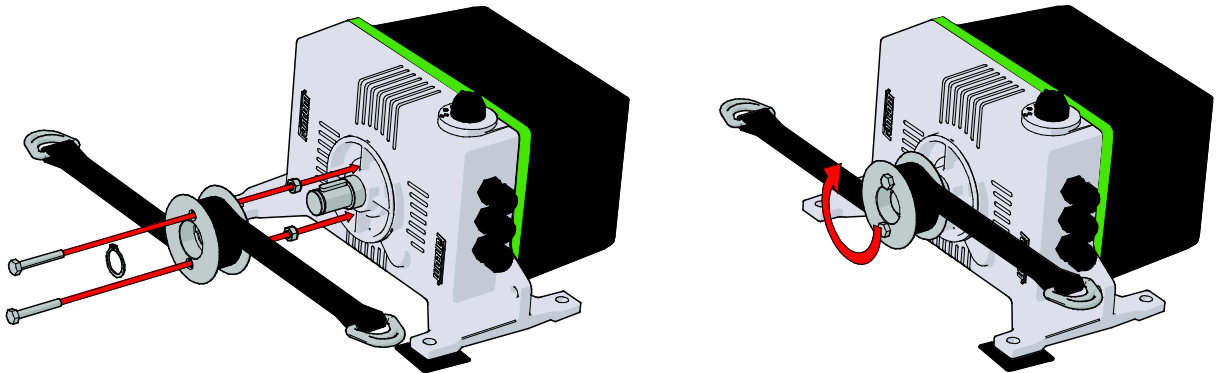
1. Pull the steel cable through the hole in the flange.
2. Mount the retaining clip on the end of the steel cable.
3. Wrap the steel cable around the flange at least once.



2.4 Mounting the strap drum and strap



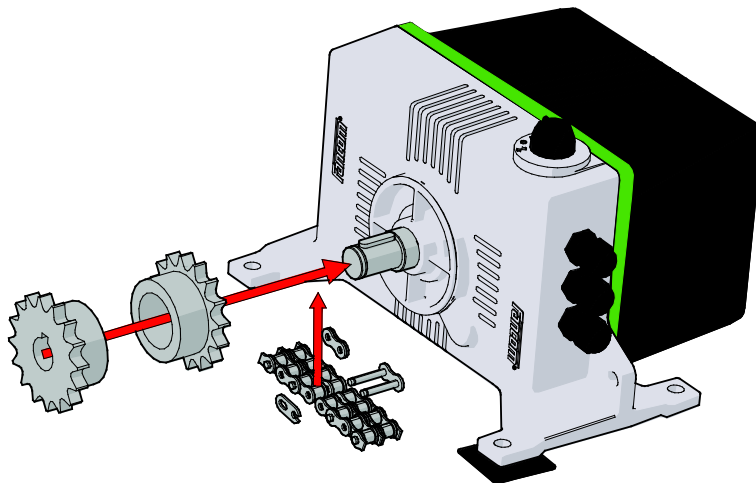
Ensure that you have the strap on the correct side and that you have the proper direction of rotation for coiling up the strap.



2.5 Mounting the pipe chain drive (optional)



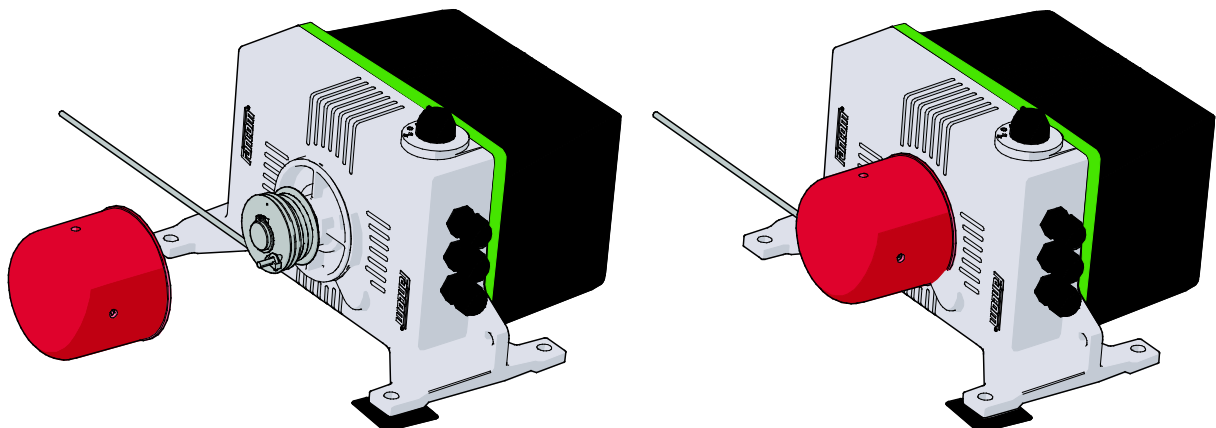
The chain drive is suitable for 1-inch pipe.



2.6 Mounting the CE cover



Placement of the CE cover is mandatory if the iM.60 is installed within reach (lower than 2.5 m above the subsurface) of humans or animals.



2.7 Connecting the iM.60

You may connect to the iM.60 as an I/O network module or as a traditional terminal.



Make sure that the iM.60 is well and properly grounded according to the guidelines.



Install the cables in such a way that they cannot become damaged and so that they can easily be replaced in the event of malfunction. Limit the length of the cables much as possible.



Low-voltage and high-voltage wires may not be placed parallel to each other but may cross each other.



When using metal ducts, Fancom advises grounding the ducts at the ends and at as many other places as possible.

Connection as an I/O network module

Setting the I/O address

Using the table below, set the I/O address with the dipswitch.

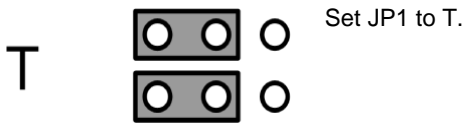


In an I/O network, all iM.60 units must have a unique address.

I/O address	DIP 1	DIP 2	DIP 3	DIP 4	DIP 5	DIP 6	DIP 7	DIP 8
AN.	ON	ON	ON	ON	ON	N/A	N/A	N/A
1	OFF	ON	ON	ON	ON			
2	ON	OFF	ON	ON	ON			
3	OFF	OFF	ON	ON	ON			
4	ON	ON	OFF	ON	ON			
5	OFF	ON	OFF	ON	ON			
6	ON	OFF	OFF	ON	ON			
7	OFF	OFF	OFF	ON	ON			
8	ON	ON	ON	OFF	ON			
9	OFF	ON	ON	OFF	ON			
10	ON	OFF	ON	OFF	ON			
11	OFF	OFF	ON	OFF	ON			
12	ON	ON	OFF	OFF	ON			
13	OFF	ON	OFF	OFF	ON			
14	ON	OFF	OFF	OFF	ON			
15	OFF	OFF	OFF	OFF	ON			
16	ON	ON	ON	ON	OFF			
17	OFF	ON	ON	ON	OFF			
18	ON	OFF	ON	ON	OFF			
19	OFF	OFF	ON	ON	OFF			
20	ON	ON	OFF	ON	OFF			
21	OFF	ON	OFF	ON	OFF			
22	ON	OFF	OFF	ON	OFF			
23	OFF	OFF	OFF	ON	OFF			
24	ON	ON	ON	OFF	OFF			
25	OFF	ON	ON	OFF	OFF			
26	ON	OFF	ON	OFF	OFF			
27	OFF	OFF	ON	OFF	OFF			
28	ON	ON	OFF	OFF	OFF			
29	OFF	ON	OFF	OFF	OFF			
30	ON	OFF	OFF	OFF	OFF			
31	OFF	OFF	OFF	OFF	OFF			

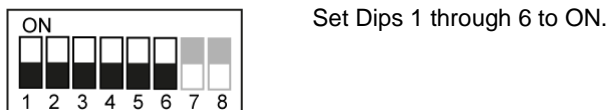
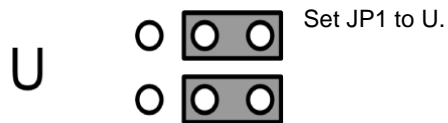
Setting the temperature measurement

As an I/O network module, the iM.60 can measure the temperature itself. This value can be used by the control computer or for independent regulation in case of emergency.



Connection as a traditional terminal

When used as a traditional terminal, the iM.60 is controlled by a signal voltage of 0/10V or 10/0V. No temperature measurement is possible in this application.



Electrical connection

Turn on the electricity after you have connected the iM.60.



Switch on the power only after all cables have been connected correctly.

2.8 Testing the iM.60

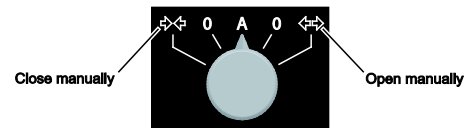
1. Check whether the iM.60 has been connected correctly.
2. Check whether the iM.60 works optimally.

3. Using the iM.60

3.1 Setting the switch

The switch on the front of the iM.60 allows for:

- Automatic regulation (*A*),
- manual closing/opening or
- off (*0*).



The manually operated selections work directly on the motor, bypassing the intelligent module.

3.2 Remote manual operation

In order to operate the motor remotely and manually (for example, to disinfect), a 10k Ω potentiometer with a switch can be connected. Once this has been turned on, the control value for the air inlet will be determined by the position of this potentiometer (8k Ω = 1%, 0k Ω = 99%).



The remote setting potentiometer takes precedent over all automatic settings - so, also over emergency settings.



This operating possibility works only if the motor's rotating switch is set to *Automatic*.

4. Adjusting the iM.60

For safe and proper functioning of the iM.60, the iM.60 must be adjusted:

1. Adjusting the limiting switches (mechanical adjustment)
2. Closed position and the potentiometer that measures the position of the intake valve
3. Open position
4. Predefined position (optional)
5. Completing adjustments

Display

After turning the iM.60 on, three characters are first displayed in sequence. These comprise the software version number (one character per second). During adjustment, indications appear on the display. In **manual mode**, the meanings of the indications are:

Display indication	Meaning
1.	Adjustment closed (minimum air inlet position).
2.	Adjustment open (maximum air inlet position).
3.	Adjustment of the predefined air inlet position.
C.	Adjustment of the minimum air inlet position accomplished. (closed)
O.	Adjustment of the maximum air inlet position accomplished. (open)
P.	Adjustment of the predefined air inlet position accomplished.
F.	Adjust: too small difference on the control entrance between closed and open adjustment.
E.	Error during the determination of the position within the adjustment procedure. (error)

In **automatic mode**, the meanings of the indications are:

Display indication	Meaning
0.	Idle position, waiting for a change in the control value or feedback.
1.	Motor sends closed.
2.	Motor sends open.
3.	Waiting position after turning on (when controlled via 0-10V).
4.	Waiting position after turning on (when controlled via and I own network; duration is dependent on the address).
5.	Minimum waiting position after a sending action.
6.	Idle position in which the control is determined by the remote control.
7.	Motor is standing still against a limiting switch.
U.	Due to problems, the iM.60 now controls based on the predefined position.
L.	Due to the I/O network going down, the iM.60 now runs independently based on its own temperature measurements.



The flashing dot on the display indicates that the intelligent module is functioning normally and is getting power from a regular 24 V AC source.



Adjustment is only possible if the operation switch is not in the automatic (A) position.



When applying a 0-10V/10-0V connection between the iM.60 and the regulator, the appropriate voltage must be provided during the adjustment procedure for the open and closed position.



Ensure that the steel cable is always wrapped around the drum at least one complete turn when the air inlet is completely open.



The minimum rotation from open to closed must be a minimum of 0.7 revolutions.

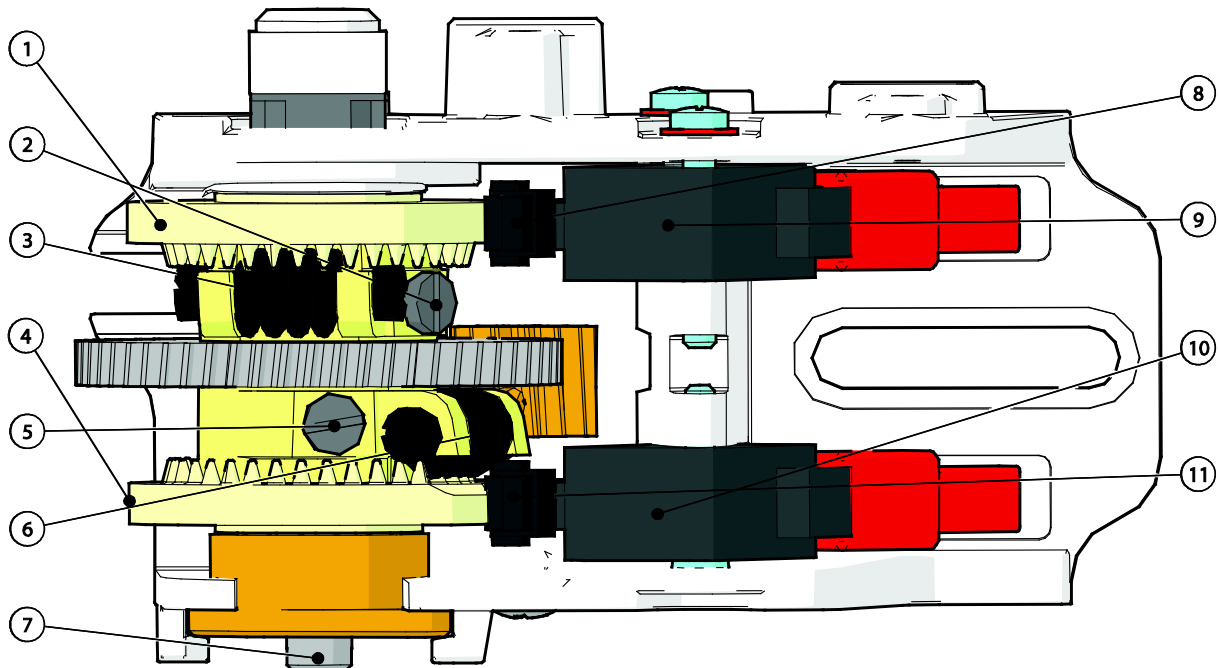


The minimum difference between the open and closed voltage must be 2.2 V.

4.1 Adjusting limit switches



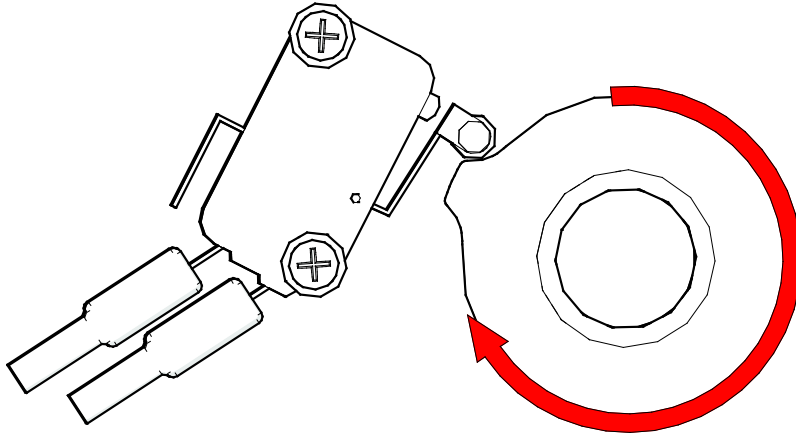
Check to make sure that all the electrical connections have been made properly before you adjust the limiting switches.



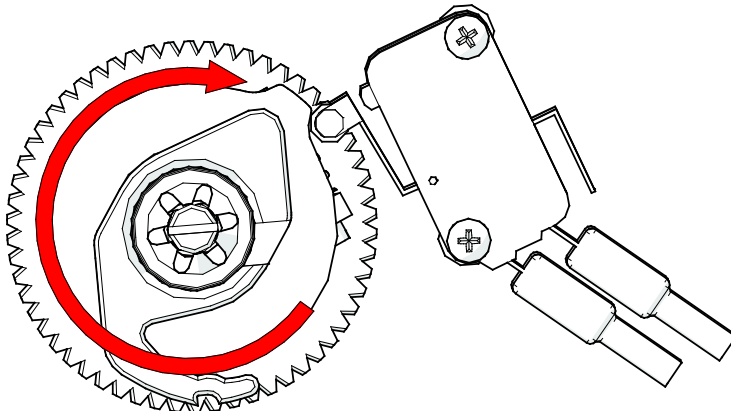
No.	Description	No.	Description
1	Cam disc in the closed position	7	Potentiometer setting
2	Screw for affixing the cam disc in the closed position	8	Roller on the switch arm in the closed position
3	Worm gear for fine adjustment of the closed position	9	Limiting switch for the closed position
4	Cam disc in the open position	10	Limiting switch for the open position
5	Screw for affixing the cam disc in the open position	11	Roller on the switch arm in the open position
6	Worm gear for fine adjustment of the open position		

To adjust the limiting switches, proceed as follows:

1. Open the iM.60 housing.
2. Position the cam discs (1 and 4) such that these are positioned freely on the shaft (so the you can twist the cam discs).
3. Place the hand switch in the **CLOSED** position ($\rightarrow\leftarrow$).
4. Close the intake valve completely in order to adjust the **CLOSED** position.
5. Turn the cam disc (1) so that the cam is against the underside of the limiting switch's (9) switch arm roller (8).



6. Tighten the screw (2) on the cam disc. Fine adjustment can be done by turning the worm gear (3).
7. Place the hand switch in the **OPEN** position ($\leftarrow\rightarrow$).
8. Close the intake valve completely in order to adjust the **OPEN** position.
9. Turn the cam disc (4) so that the cam is against the upper side of the limiting switch's (10) switch arm roller (11).



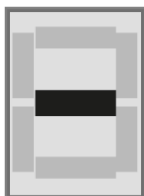
10. Tighten the screw (5) on the cam disc. Fine adjustment can be done by turning the worm gear (6).

4.2 Adjusting the CLOSED position



For 0-10V or 10-0V control, you should ensure that the control computer's analogue output sends out 1% (for an I/O network control system this is not important).

1. Set the manual switch to the CLOSED position ($\rightarrow\leftarrow$) and allow the air intake valve to close.
2. Turn the potentiometer completely to the left.
3. Press the pushbutton until the number **1** appears in the display and then release the pushbutton. The propulsion module is now in the 1% adjustment mode. After releasing the pushbutton, a dash will appear in the display.
4. Adjust the potentiometer with a screwdriver such that the dash is in the middle position of the display.



5. Press the pushbutton to confirm the setting. The letter **C** now appears in the display. This means that the adjustment was successful.



Is there something other than **C** in the display? Then the adjustment was not successful. If no improvement occurs, continue with the adjustment of the **OPEN** position. If the **OPEN** position is now correctly adjusted, then the adjustment will have been successful.

4.3 Adjusting the OPEN position



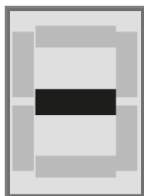
For 0-10V or 10-0V control, you should ensure that the control computer's analogue output sends out 99% (for an I/O network control system this is not important).



Factory setting 99% = 0.1V, 4000 Ω

- The limiting switch may be adjusted between 95% en 100%. If the desired position is not achieved during the adjustment (because the limiting switch is being operated), no alarm will be issued. When activating the limiting switch below 95%, the iM.60 will stop and generates alarm **A2**.

1. Set the manual switch to the OPEN position ($\leftarrow\rightarrow$) and allow the air intake fell to go to the desired position.
2. Press the pushbutton until the number **2** appears in the display and then release the pushbutton. The propulsion module is now in the 99% adjustment mode. After releasing the pushbutton, a dash will appear in the display.
3. Adjust the length (for example, by cinching) such that the dash is in the middle position of the display.



4. Press the pushbutton to confirm the setting. The letter **O** now appears in the display. This means that the adjustment was successful.



Is there something other than **O** in the display? Then the adjustment was not successful. If no improvement occurs, then repeat the entire procedure.

4.4 Adjusting the PREDEFINED position



Factory setting = 50%. If this is the proper position for you, you don't have to perform the following steps.

1. Set the air inlet with the manual operation switch to the position that should be assumed if mains power is interrupted.
2. Press the pushbutton until the number **3** appears in the display and then release the pushbutton.
3. Press the pushbutton to confirm the setting. The letter **P** now appears in the display. This means that the adjustment was successful.

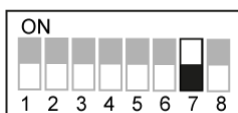
4.5 Completing adjustments

After adjustment, set the operating switch to Automatic (**A**) so that normal functioning is possible.

5. Extra possibilities

5.1 Using the emergency battery (optional)

If a battery pack is built into the iM.60, this is kept topped up by a built-in battery charger. The condition of the battery is tested automatically during the charging process. If it doesn't meet the requirements (<22Volt) any longer, this is then shown on the internal display as **A5** (see page 17). The condition of the battery is also available via the I/O network so that a control computer that includes the proper functionality can indicate whenever the battery is no longer reliable.



Set Dip 7 to OFF.



5.2 Predefined position / adjusting independently

If the control signal or 24 V AC power supply is interrupted, the iM.60 can control the air inlet position independently. This may be a calculated position or the preferential position (predefined). This predefined position can be set (see page 13).

No control signal (power)

When the control signal is interrupted, the air inlet will open completely (with a 10-0 V control signal) or close completely (with a 0-10 V control signal).

No control signal (communication)

If the iM.60 is included in an I/O network and communication is interrupted, then the **A4** alarm will appear after 6 minutes. Independent regulation will occur if a temperature sensor is connected. The regulation's basic principles are:

- The current temperature becomes the set point temperature.
- The current valve position becomes the minimal valve position or - if lower - the predefined valve position.

The intelligent module will calculate the air intake position itself based on the temperature measurement and the settings. In this case, an **L** will be displayed on the display of the printout by pressing the pushbutton. If no temperature sensor is connected, the predefined position will be sought. An **L** appears on the display.

Loss of power (power failure)

If the regular 24 V AC power is interrupted (as long as an internal emergency battery is connected and the control current is still good):



- With analogue control, the iM.60 goes to the preferential position (predefined).
- With control via an I/O network, adjust the iM.60 until the battery voltage is lower than 22 Volt. After this, the iM.60 will go to the preferential position (predefined).

In both cases, an **A3** will be shown on the display.

When using an external emergency power supply (UPS) instead of internal batteries, the 24 V AC will not be interrupted. The UPS must, however, be equipped with a Power Fail (PF) output (normally open contact) that connects the PF input on the iM.60 whenever regular mains power is interrupted. The iM.60 will go to the preferential position.

5.3 Reversing the direction of rotation

Starting with software version A1.3, the direction of rotation of the propulsion motor can be reversed. This possibility is used whenever the connection has been made in the opposite direction.

	Reversing the direction of rotation negatively impacts precision.
	After reversing the direction of rotation, the Open/Close indication on the printout is assigned the opposite function.

To reverse the direction of rotation, perform the following steps:

1. Remove power from the motor.
2. Set DIP 8 to OFF (= inverse direction of rotation).
3. Switch the connection wires as follows:
 - Switch (2) + (3) on the connector of the manual operation switch ((2) becomes brown, (3) becomes white).
 - Reverse the potentiometer + and – on the printout (+ (1) becomes green, - (3) becomes red); the L stays in the same place.
 - Reverse the limiting switches on the printout (Open (4+5) becomes black, Closed (6+7) becomes brown).
4. Plug the motor in and perform the adjustment procedure again.







5.4 Connecting the maximum thermostat

You may connect a maximum thermostat as an extra security. The air intake will open completely whenever the maximum thermostat is activated. The maximum thermostat and a remote control may be switched in parallel. The maximum thermostat also takes precedence over (overrides) the manual control.

This operating possibility works only if the motor's rotating switch is set to **A**.

6. Alarms

When an **A** is shown in the display, followed by a number, this indicates an alarm. The table below provides an overview of the alarms.

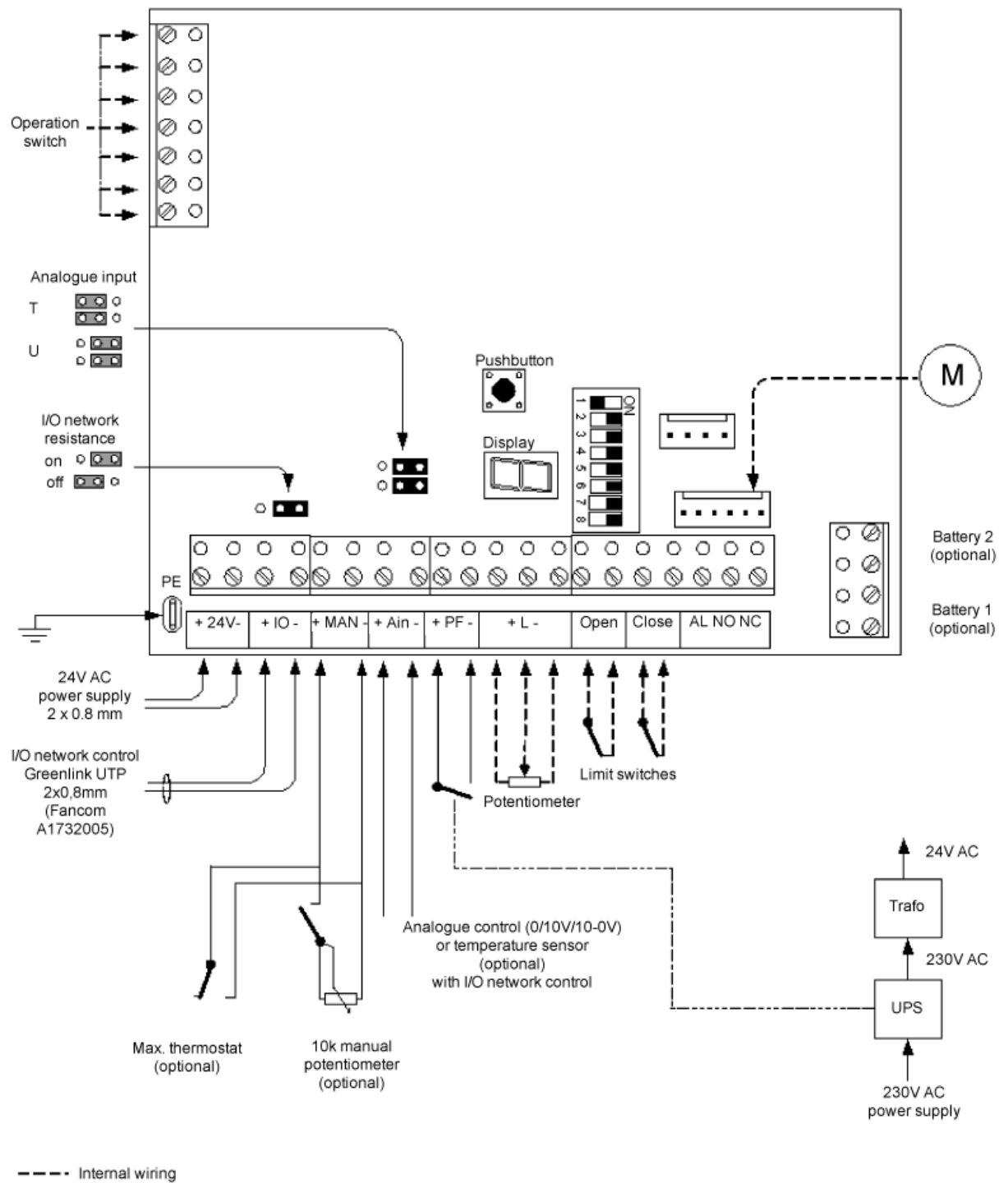
Alarm indication	Meaning
A0	Backup alarm: No settings available, adjustment necessary! (via I/O network A100)
A1	Defective memory.
A2	Intake valve position is not achieved.
A3	Interruption of power, system is operating on emergency power facility.
A4	No I/O network communication.
A5	Battery test indicates error.
A7	Alarm test
	The notification of a retracted alarm can be deleted by pressing the pushbutton on the printout.
	A control computer connected to the iM.60 via an I/O network can take over the alarm notification (as long as this functionality is supported).
	An alarm test (A7) can be executed by pressing the pushbutton until the indication A is shown in the display. For this, the rotating switch should be operated manually.
	If an alarm indication appears on the display, the alarm relay has been activated.
	The calibration value for a maximum potentiometer position may expire in the event of unpowered overload.
	An interruption of power supply due to overload may cause the calibration value to expire in the event of a maximum stroke in the fully open position.

7. Technical specifications

Mains power supply	
Mains voltage	24 V AC ($\pm 10\%$)
Emergency power	24 V DC ($\pm 10\%$)
Mains frequency	50/60 Hz
Max. Amperage	0.8 A
Power consumption	20 W
Battery	2 x 12V DC
PF input (Power Fail)	normally open contact
Control	
Power input (analogue input)	0-10 V DC (10-0 V DC)
I/O network	Digital
Alarm	
Alarm relay	30 V AC/60 V DC, max. 2A
Propulsion	
Torque	Max. 60 Nm
Holding torque	Max. 40 Nm
Tensile strength 50 mm/65 mm	210 kg/160 kg
Holding force 50 mm/65 mm	140 kg/105 kg
Min. number of revolutions	0.7
Max. number of revolutions	2.7
Speed	1.2 rpm
Min. -max. stroke length ($\varnothing 50$ mm) 4 mm cable	11-40 cm
Min. -max. stroke length ($\varnothing 65$ mm) 4 mm cable	15-53 cm
Manual operation	
Rotary switch	Closed-0-A-0-open
Potentiometer input (for remote manual operation) and/or	8k Ω - closed, 0k Ω - open,
Max. thermostat (for control via I/O network)	∞ - no manual operation
Housing	
Plastic housing with screw closure	IP54
Dimensions (l \times w \times h)	284 x 237 x 182 mm
Weight (unpackaged)	4.7 kg
Ambient climate	
Operating temperature range	0°C to +40°C
Storage temperature range	-10°C to +50°C
Relative humidity	< 95%, not condensing

Accessories (optional)	
Battery pack	2 x 12 V DC / 0.8 Ah
Coercion roller/Strap drum	ø50 mm ø65 mm
Pipe chain drive	ø1 inch
CE cover	
Temperature sensor	Range -50°C - +110°C Resolution 0.1°C
Remote controlled manually operated potentiometer	10kΩ
Max. Thermostat	Instead of or in combination with a remote controlled, manually operated potentiometer
Temperature sensor	Range -50°C - +110°C Resolution 0.1°C

8. Appendix: connection diagram



9. EG declaration of conformity

Manufacturer: Fancom B.V.

Address: Industrieterrein 34

City: Panningen (the Netherlands)

Hereby declares that the: **iM.60**

Complies with the provisions of the:

1. Low voltage directive 2006/95/EC
according to NEN-EN-IEC 61010-1: 2010
2. Machine directive 2006/42/EC
3. EMC directive 2004/108/EC
Emission according to NEN-EN-IEC 61000-6-3: 2007
Immunity according to NEN-EN-IEC 61000-6-2: 2005

Place: Panningen

Date: 01-04-2014



Paul Smits

Managing Director