
Mounting- and Operating Instruction

frol
comfort

Article No. 2610



VBD 377-1 (06.02) GB

WR
RADEMACHER

Dear Customer, ...



...with the purchase of the TUBE MOTOR CONTROL you have decided in favour of a quality product from the House of Rademacher. We thank you for your confidence.

This instruction...

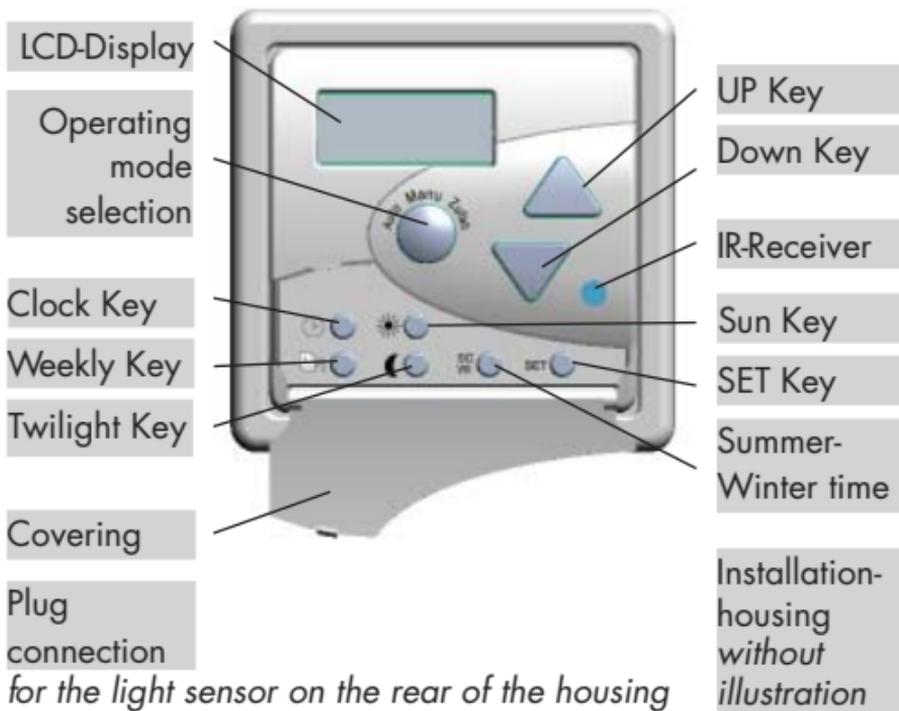
...describes the mounting and the electrical installation of your TROLL.



Please read through this instruction completely. Observe all safety advices before starting with your work. Please keep this instruction for further reference.

The guarantee expires in the case of damages occurring from not observing this instruction and the safety advices. We do not accept any liability for indirect damages resulting from this.

Overall view



Contents



Overall view	3	Basic settings	28
Explanation of signs	5	Standard program	30
Correct application	6	Weekly program	32
Wrong application	7	Sun automatic	39
Safety instructions	8	Twilight automatic	42
Functional description	10	Manual operation	43
Connection instructions	18	External Switch	47
Safety instructions	19	IR-Remote control	48
Electrical connection	20	Software-reset	53
Mounting instructions	21	What to do, if...?	55
Mounting procedures	22	Technical Data	62
Mounting construction ...	23	Work settings	64
Light sensor mounting	24	Accessories	65
Light sensor position	25	Switch programs	66
Setting instructions	26	Guarantee	67
Start-up	27		

Explanation of Signs



Danger to life caused by electric shock

This sign indicates dangers, when working on electrical connections, components, etc. It requires safety measures for the protection of health and life of the person concerned.



Here it concerns your safety

Please do observe and obey all instructions marked like this.

COMMENT

In this way we draw you attention to the perfect function of important contents.



The necessary steps to be taken are indicated in form of enumeration.

Correct Application



Local operation

The TROLL tube motor control is only to be used for the connection and control of a tube motor. The tube motor has to be equipped with an end limit switch (mechanic or electronic).



Please do observe the instructions given by the motor manufacturers regarding switching time and maximum operating time.

Operating Conditions

- ◆ Do only operate the Troll in dry rooms.
- ◆ The mounting place has to be equipped with a power supply of 230 V/50 Hz including an installed clearing device (safety fuse) for the electrical connection.

Wrong Application



It is not allowed to connect or control other consumers or facilities, than the ones stated above.

Do only use original parts of the manufacturer.

The TROLL roller shutter control, the manual sender, and the Rademacher tube motors are coordinated components. Non-original components, which replace or influence the function of the Troll are to be employed only after being released particularly by Rademacher GmbH. As manufacturer we do not accept any guarantee for the application of non-original components and the indirect damages resulting from this.



Danger to life exists caused by electric shock

The electrical connection of the Troll is only allowed to be executed by an authorized electrician. Observe the regulations of the local power supplier.

- ◆ Before starting to execute the electrical connection switch the power line/connecting point in an idle condition and secure it against restoring power.
- ◆ Control if the power line/connecting point is really in an idle condition.

Safety Instructions



The application of defective appliances can endanger people and cause damages (electric shock, short circuit).

- ◆ Before mounting examine the Troll for not being damaged and do never use defective or damaged appliances.
- ◆ In this case please do contact our service department.



Incorrect executed repairs can endanger your life caused by electric shock or it can lead to the destruction of the Troll.

Please have all your repairs on the Troll executed by an authorized service department.

Functional Description



The Troll serves to control the tube motors and it can be mounted in each commercial flush box using the enclosed installation housing.

The different operating modes and functions:

- ◆ Manual mode
 - with the operating keys on the appliance
 - with the assistance of an external sensor
 - with an infrared manual sender

- ◆ Automatic mode
 - Standard and weekly program
 - Sun automatic
 - Twilight automatic
 - Random mode

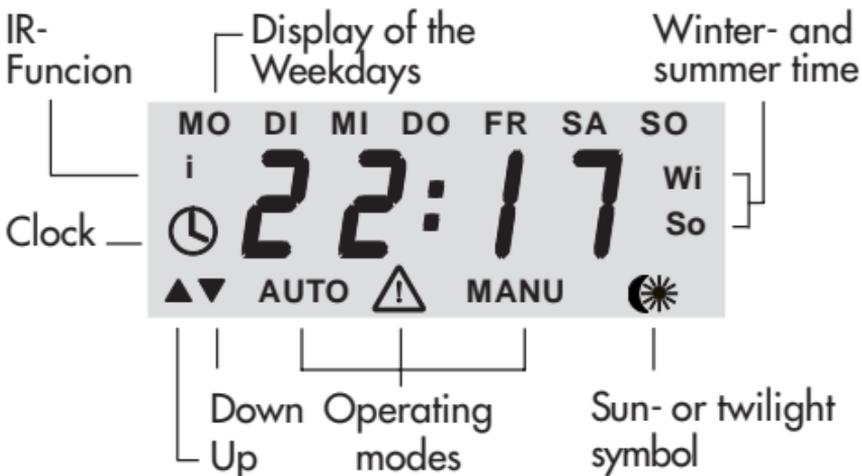
- ◆ Additional
 - Switching between summer and winter time

Functional Description



The LCD-Display of the TROLL informs you about:

- ◆ the adjusted operating mode
- ◆ the activated functions
- ◆ the actual day time
- ◆ the adjusted swichting times



Functional Description



Manual mode

Operation by hand is always possible

Using manual mode the roller shutter can be opened/closed with the (▲) UP and (▼) DOWN key and stopped again.

The manual operation is possible with ...

- ◆ the operating keys on the appliance
- ◆ with the assistance of an external switch
In addition, the parallel connection of several Trolls on one external switch permits the mutual “remote” control of several roller shutter drives.
- ◆ one infrared sender of Rademacher
For this reason, the Troll is equipped with an infrared receiver. In addition, with the infrared manual sender the control of several drives is possible.

Functional Description



Automatic mode / Standard program



Adjustment of an opening and closing time for your roller shutter. The adjusted switching times are valid for all weekdays.

Automatic mode / Weekly program



Individual every day adjustment of the opening and closing time for your roller shutter. In addition, it is possible to adjust one opening and closing time, respective, valid for all weekdays.

Functional Description



Automatic mode / Random mode



You can set the time control to random mode via the selection key for operating modes. Through this, the adjusted switching times are delayed by up to 30 minutes.

Automatic mode OFF



With the assistance of the selection switch for operating modes, the automatic mode can be switched off. All adjusted switching times are not effective any more. Sun and twilight functions continue to be valid.

Functional Description



Sun and twilight automatic

The sun and twilight automatic together with the light sensor (Article no. 3720) allow the control of your roller shutter depending on the brightness. In this case the light sensor is fastened to the window pane and connected to the Troll using a plug.

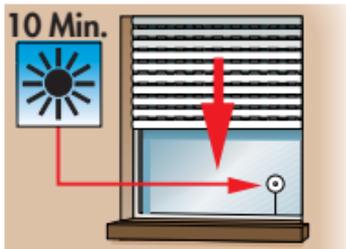
Sun automatic

The sun automatic enables the automatic moving down and up of the roller shutter after the adjusted limiting values are exceeded. The final position of the roller shutter can be chosen via the position of the light sensor situated on the window pane.

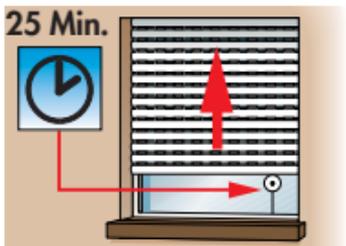
Functional Description



Sun automatic



If the adjusted limiting value is exceeded by daylight, the roller shutter is lowering until the light sensor is reached after approximately 10 minutes.



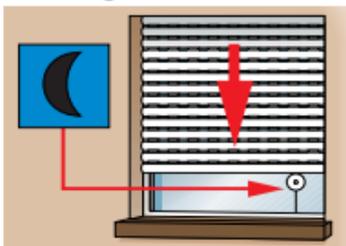
After approximately 25 minutes the roller shutter is moving up for a short distance to release the sensor. In case of further sun exposure the roller shutter remains in this position.

With decreasing brightness the roller shutter moves to the upper limit stop.

Functional Description



Twilight automatic



With entering of twilight the roller shutter lowers after the pre-adjusted limiting value is exceeded for approximately 10 seconds moving to the bottom limit stop.

The roller shutter does not open before the adjusted opening time is reached or after manual command UP.

COMMENT

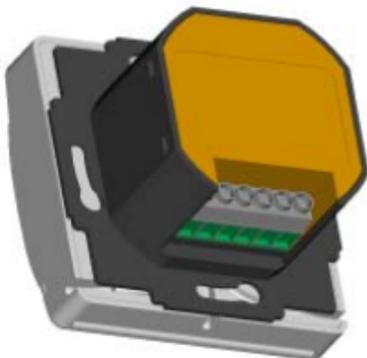
If the moving down of your shutter is to be executed by twilight automatic you have to adjust the automatic closing time to a time after the twilight is entered.

Before the electrical connection



Assembly and electrical connection of the Troll...

... are only to be executed with the enclosed installation housing. The connection terminals are located on the bottom side of the installation housing.



Limit stops adjustment of the tube motor

Before the final electrical connection is executed the limit stops of the tube motor have to be adjusted. Please do observe the details of the respective operating instructions.



You are urgently requested to adjust both limit stops as otherwise malfunction can occur.

Safety instructions/Electr. connection



Danger to life exists caused by electric shock.
The electrical connection of the Troll is only allowed to be carried out by an authorized electrician. Please do observe the safety instructions stated on page 8.



Faulty wiring can lead to short circuit and to the destruction of the appliance.

◆ Please do observe the sequence of the pin connection.

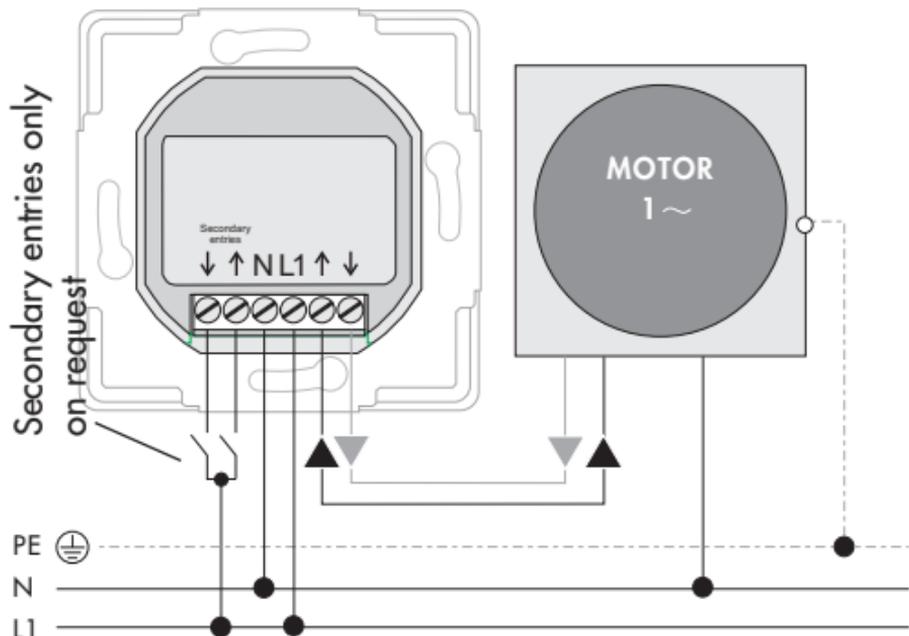


◆ Please do observe the details regarding the electrical connection stated in the operating instruction of your tube motor.

Electrical connection



Basic circuit diagramm



Mounting Instructions



In addition, the following is required

1 x 58-flush socket according to DIN 49073.

(We recommend a deep socket)

1 x Covering frame, enclosed (*)

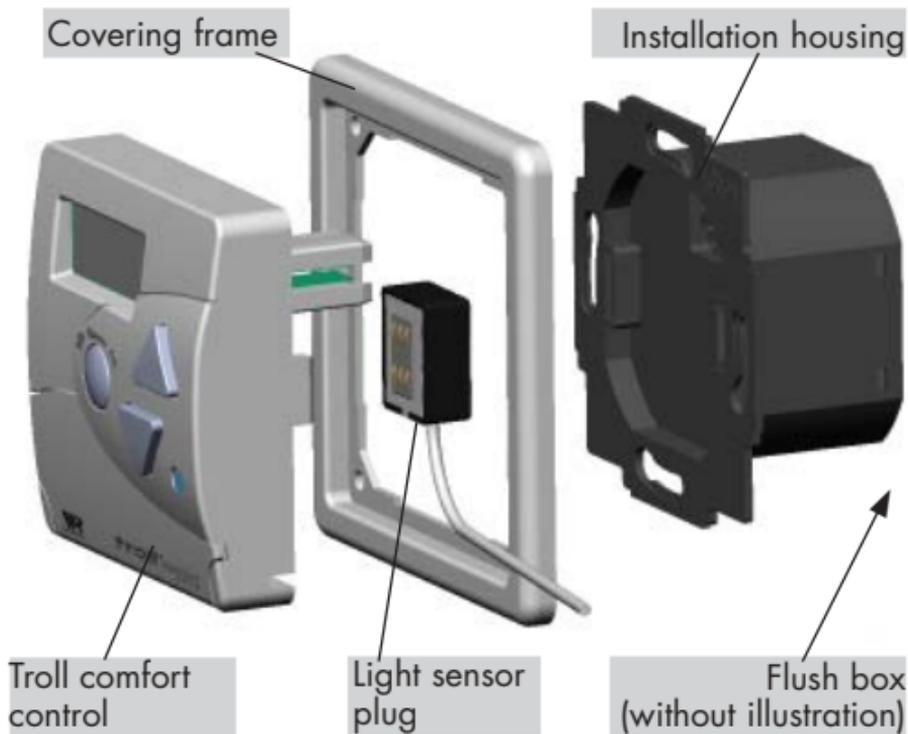
- * The Troll can be integrated with most commercially available switch and frame programs (see switch program list on page 66) or it can be mounted with the enclosed covering frames.

Mounting Procedures

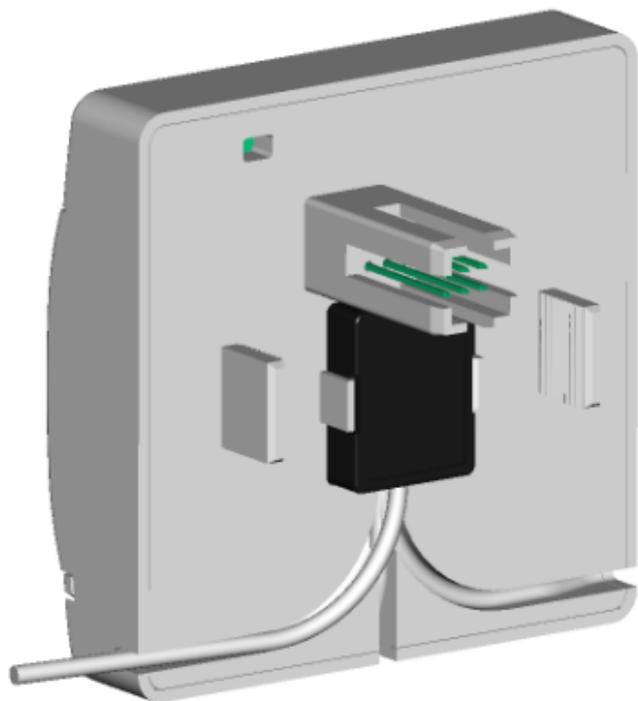


- ▼ Put power supply in an idle condition.
- ▼ Electrical connection (if not already executed).
- ▼ Push installation housing into the flush box and tighten with the corresponding screws.
- ▼ Put the covering frame on.
- ▼ If available, insert the light sensor plug into the bottom side of the Troll and press the sensor cable carefully into the cable guiding.
(A later mounting of the light sensor is also possible)
- ▼ Insert the Troll carefully.
- ▼ Switch on power supply.

Mounting construction



Mounting of Light sensor



Correct Position of the Light sensor



Fasten the light sensor with the suction cup on the window pane to measure the current brightness.

Sun automatic

Choose the position of the light sensor to which your roller shutter is to lower on exceeding the limiting values (too much sun).

Twilight automatic

The light sensor position chosen for the sun automatic can be maintained.

COMMENT

Please do avoid damage to the light sensor as well as to the sensor cable.

- ◆ The light sensor has to be removed from the window only by using the pulling handle.
- N e v e r pull on the sensor cable.
- ◆ Do not buckle the sensor cable strongly.

Adjustments/Important Instructions



Observe exceeding of the time provided

The current time appears in the display if no adjustments are entered for a longer period of time.

Deactivation of switching times

Set the requested time to **0:00**, thus the belonging control command is not executed.

Observe key symbols



This means: press or tip the key



This means: let the key go

Start-up of the Troll

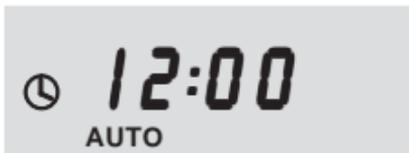


▼ Connect current

If this display appears you have to press the CLOCK key.



If any time appears in the display after switching on, please do carry out a software reset (see page 53) before executing further adjustments.



The Troll is ready for operation immediately after switching on, provided the limit stops of the tube motor are adjusted.

Basic adjustments/Current time



At first, you have to adjust the current time so that your Troll is able to operate.

Adjust current time (f. ex. 13:00 o'clock)



The figures of the clock are changing in fast forward running of time.



Let the key go as soon as the current day time is reached.

- ◆ Slow forward running time: hold key tip **SET** key
- ◆ Fast forward running time: hold key and **SET** key
- ◆ Slow backward running time: hold **SET** key tip key
- ◆ Fast backward running time: hold **SET** key and key

Summer and Winter time



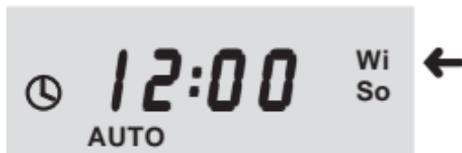
Depending on the season your Troll can be changed between summer and winter time.

- ◆ With changing over from winter to summer time the internal clock is put forward by 1 hour.
- ◆ With changing over from summer to winter time the internal clock is put backward by 1 hour.

Changing over between summer and winter time



**press
repeat**



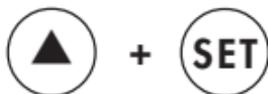
Standard Program



▼ **Adjust general opening time**
(f. ex. from 7.00 to 7:15 o'clock)



press and hold,
forward running
of time



let keys go,
as soon as the desired opening
time is reached

- ◆ Slow forward running time: hold ▲ key tip **SET** key
- ◆ Fast forward running time: hold ▲ and **SET** key
- ◆ Slow backward running time: hold **SET** key tip ▲ key
- ◆ Fast forward running time: hold **SET** key and ▲ key

Standard Program



▼ Adjust general closing time (f. ex. from 20:00 to 19:30 o'clock)



**press and hold,
backward running
of time**



let keys go
*as soon as the desired
closing time is reached.*

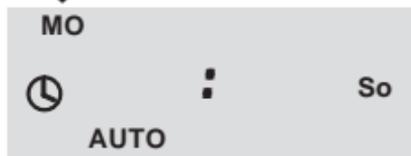
- ◆ Slow forward running time: hold ▼ key tip **SET** key
- ◆ Fast forward running time: hold ▼ and **SET** key
- ◆ Slow backward running time: hold **SET** key tip ▼ key
- ◆ Fast forward running time: hold **SET** key and ▼ key

Weekly Program



If you would like to adjust separate opening and closing times for each individual day of the week, you have to activate the input mode of the weekly program.

▼ Activate input mode of the weekly program



▼ Adjust current day



Tip several times, ...

...until the current weekday appears in the Display

▼ **Adjust daily switching times**

Being able to adjust the desired switching times for each weekday, the program starts again with Monday after pressing once again the weekly key.

COMMENT

When activating the weekly programs, the opening and closing times of the standard program are adopted.

The adjustment or correction of the opening and closing time for each individual weekday is effected analogous to the adjustments of the standard times.

▼ Adjustment of the opening time for Monday



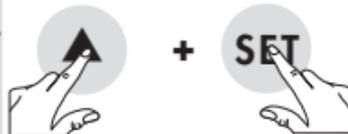
1 x

The opening and closing time adjusted for Monday is shown in turn.



1 x

Calling of works adjustment



+

SET

press and hold
(forward running of time)



+



Let the keys go as soon as the new opening time appears



1 x

Calling the closing time and analogous adjustment



Calling the next day, repeating the adjustment for each weekday.

Terminate adjustments



press several times,...
...until all input points of the weekly program have been passed, if you do not want to execute further adjustments.

Adjustment of two mutual weekly switching times...

*...which are valid on each day, in addition to the individual daily switching times.
If no input is made, these switching times remain inactive.*

Weekly Program



▼ Activate input mode



1 x



After the adjustments for the last weekday, this display appears.

▼ Adjustment of the additional opening and closing times, as described before.

▼ Leaving the input mode

The weekly program is now active.



1 x



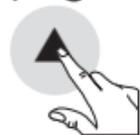
Weekly Program



Control or amend the daily switching times

If the weekly program is active you can control, and if necessary, amend the switching times of the current weekday by tipping the (s) UP or (t) DOWN key.

Calling the actual opening time (e.g. for Monday)



1 x

↓



Amending the current daily switching time

Please observe the details given on page 30/31 concerning forward/backward running of time.

Changing between weekly and standard program

Each time the weekly key is pressed, the operating mode changes.



2 s



The Standard programm is active.

Adjusting the Sun Automatic



The sun automatic is switched on or switched off by repeated tipping of the key.



1 x

Adjusted limiting value



Current measured brightness (0-29). With increasing sun, the measured value rises.

entirely bright = 29

dark = 0

Adjusting the Sun Automatic



▼ Observe the sun symbol in the normal display:

- OFF Sun automatic is switched off
- ON Sun automatic is switched on
- FLASHING Sun automatic is active

▼ If the Sun program is active, it is interrupted by:

- ◆ Manual Operation
- ◆ Addressing an automatic function
- ◆ Activating the IR remote control
- ◆ Operating an external manual switch

Afterwards the sun program is ready for operation, once again.

Adjusting the Sun Automatic

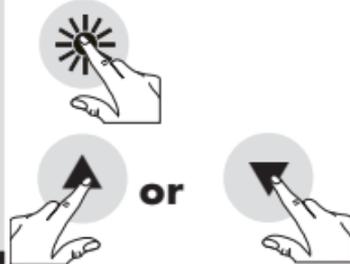


Adopting the current brightness value as limiting value

Execute the adjustment of the limiting value with the brightness used for lowering the roller shutter.



Amending the adjusted limiting value
pressing and holding
additionally
pressing



Adjusting the Twilight Automatic



Switching on or switching off the twilight automatic and adjusting the limiting value analogous to page 41, now using the moon key

5

AUTO

5

So

entirely dark = 29

bright = 0

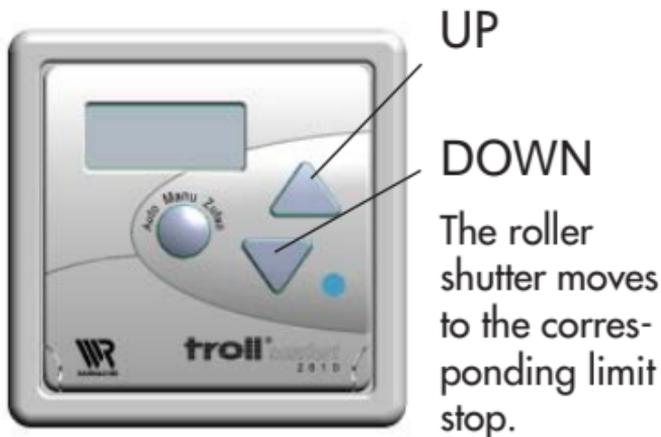
Observe the off-period for the renewed activation of the twilight automatic

If your roller shutter is closed using the twilight automatic and, afterwards, reopened through a manual moving command, the twilight automatic goes into action only after approx. 1 hour.

Operating the Troll/ Manual Mode



The operation by hand is in every operating mode possible and it has priority before the automatic mode.



Stop the roller shutter



or



press shortly

Operating the Troll/ Manual Mode



Normal mode or tipping mode

You can operate the Troll in normal operation (works adjustment) or in tipping mode (changing-over see page 45).

Normal operation: The roller shutter moves to the respective adjustment after pressing the operating key each time.

Tipping mode: The roller shutter moves as long as the respective operating (see page 46) key remains to be pressed.

ATTENTION:

After changing-over to the tipping mode, a reset to the normal operation is not possible.

It is urgently requested to execute a software reset (see page 53), after changing-over to the tipping mode.

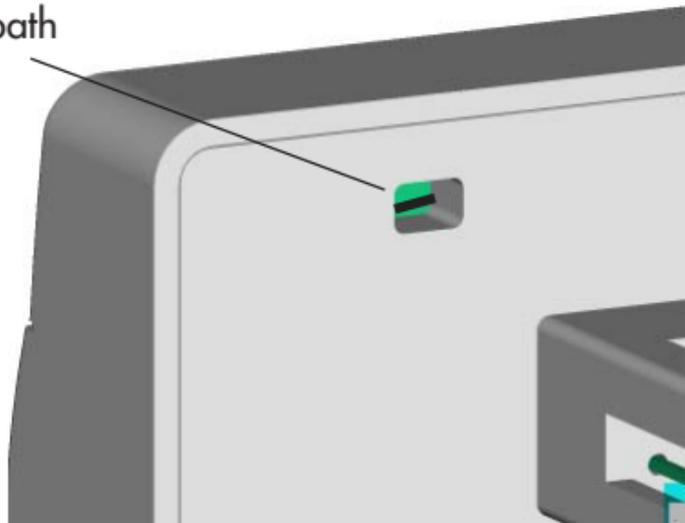
Operating the Troll/ Manual Mode



Changing over from the normal mode to the tipping mode.

In this case, a connecting path has to be quarried out on the backside of the Troll using a small screw driver.

Connecting path



Operating in tipping mode



1 x tipping

The roller shutter opens/closes until you let the key go.



3 s pressing

The roller shutter moves to the upper/bottom limit stop.



tipping

The roller shutter stops.

Remote Control with External Switch



It exists the possibility to operate the Troll with an external switch or another control.

Switching sequence with external sensor

Ext. UP press (▲) key the roller shutter moves up

Ext. UP tip (▲) key the roller shutter stops

or

Ext. DOWN press (▼) key change direction of rotation

The same applies for the DOWN (▼) direction

COMMENT

If required, several Trolls can be connected parallel to a manual switch. They can be operated by remote control. In this case, the tube motors are synchronized with each switching process by means of a switching logic.

Remote Control with IR Manual Sender



The Troll is equipped with an infrared (IR) receiver. Through this it is possible to control one or several roller shutter drives with one Rademacher infrared manual sender.

Control-LED

Collective Key
(all)

Channel Keys

*With these keys,
the roller shutter
drives can be combined in
groups.*

Battery Shelf



Sender-Eye

Normal Operation
*Lifting and lowering
of the roller shutters.*

Tipping Mode
*The roller shutter
moves as long as the
key is pressed.*

STOP Key

▼ Normal Operation (without allocation of a channel)



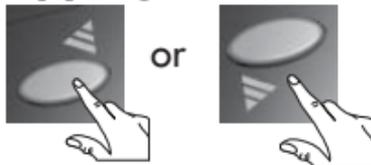
Open

Close

press

The roller shutter moves in the corresponding direction. Pressing the (▲) or (▼) key once again, the roller shutter stops.

▼ Tipping mode



Open

Close

As long as one of the keys is pressed, the roller shutter moves (s. page 46).

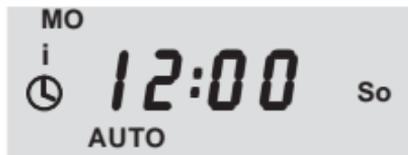
Multiple channel mode

Each Troll can be allocated with a channel number and, thus, it is possible to combine your roller shutters into groups. If you would like to control several roller shutters at the same time, the combination has to be made under the same channel number.

Activate multiple channel mode



4 s



Allocate channel number



or ...



Press the requested channel key within approx. 4s

Multiple channel mode



**at first, press the requested
channel key**

then within 3 minutes



**the requested control
command**

Delete channel allocation

SET



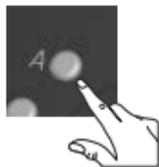
4 s

**press without further
input**

The collective key (Key 'A')

In the multiple channel mode it is possible to operate all controlled roller shutters mutually without deleting the adjusted groups or changing into single channel mode.

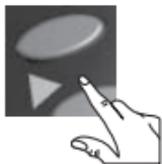
Collective mode



press collective key A



or



press
All controlled roller shutters move in the requested direction.

Software-Reset



If you would like to delete your adjustment, a software reset has to be executed.

INDICATION!

After executing a software reset, the works adjustments are valid.

▼ Delete all adjustments



▼ **After approx. 8 seconds the software reset is executed and the display deletes.**

Software-Reset



Let the keys go, if the display deletes.

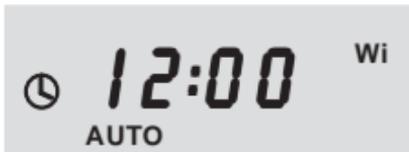
Display after a software reset or after 8 hours of power failure.



Readjust the current time



1x



Repeat all adjustments starting from page 28

What to do, if ...?



...the display is flashing?

Cause: Power failure

Solution: Remove the cause for power failure and verify the display

- ◆ If the current time appears, your Troll is active again.
- ◆ If the reset display (see page 54) appears, the power failure exceeded 8 hours. Press the CLOCK key and repeat all adjustments, starting from page 28.

What to do, if ...?



... despite the adjusted switching times no automatic commands are executed?

Cause: Your Troll is possibly in the manual mode (MANU)

Solution: Switch the Troll to automatic mode (AUTO).

... the adjusted switching times are not met exactly?

Cause: Your Troll is possibly in the random mode (RANDOM).

Solution: Switch the Troll to automatic mode (AUTO).

What to do, if ...?



... the Troll's manual or automatic reaction is not proper any more?

Solution: Execute a software reset according to page 58. Afterwards repeat all adjustments, starting from page 28.

If necessary, check the Troll with the works adjustments.

... the sun automatic is disturbed?

Cause: The sensor wire of the light sensor has been buckled to strong. An existing buckling position can be recognised on the sensor wire.

- ◆ The light sensor is influenced through shadow formation (f. ex. bushes).

What to do, if ...?



- ◆ With active sun automatic (sun symbol is flashing) a time controlled or manual travelling mode has been made.

The sun automatic is interrupted and it starts again. The procedure to come depends on the sun condition.

Solution: In this case the light sensors have to be exchanged completely.

- ◆ Remove the cause for creating the shadow formation.
- ◆ Observe the condition of the sun symbols indicated in the display. It has to flash, if the sun program is active.

What to do, if ...?



... the roller shutter closes to far with active sun automatic (it overruns the light sensor)?

Cause: The brightness behind the roller shutter (at the sensor) is even higher than the adjusted limiting value.

Solution: The adjustment for the limiting value of the sun automatic has to be increased.

... the roller shutter is not moving down in the evening with activated twilight automatic?

Cause: The limiting value for the twilight is not exceeded.

Solution: Verify, if the sensor is influenced by a different light and, if necessary, correct the limiting value.

What to do, if ...?



... if the Troll does not accept the IR transmitting signal?

Cause: Incorrect orientation of the remote control.

- ◆ Direct solar radiation or artificial light do influence the range of the sender.

Solution: Point your remote control as directly as possible to the Troll.

... the roller shutter does not react after activating the manual sender?

Cause: You may operate the Troll in multiple channel.

Solution: At first, press the channel number and afterwards the corresponding control command.

What to do, if ...?



... the control light of the IR manual sender does not illuminate when pressing the key?

Cause: The battery is not inserted correctly or it is spent.

Solution: Verify the polarity of the battery and exchange it, if necessary.

... the range of the IR manual sender abates?

Cause: The battery is spent.

Solution: Exchange the battery.

Technical Data



Supply Voltage:	230 V/50 Hz
Switching Capacity:	8 (4) A
Protection class:	II
Standby-Capacity:	2 W
Secondary Entries:	2
Breaking Voltage of Secondary entries:	230 V
Connecting cross section:	3 x 1,5 mm ²
Mounting mode:	concealed
Dimensions:	70 x 70 x 17,8 mm
Mounting Depth:	34 mm
Permitted Ambient Temp.:	0 to 40 °C

Technical Data



Power reserve:	approx. 8 hours
Adjustment ranges:	sun sensitivity 2000 - 20.000 Lux twilight sensitivity 2 - 50 Lux
Maintain data:	With a short power failure the times adjusted by the operator and the current data (time/day) continue to maintain. In this case the display is flashing and is slowly getting darker after some time.

Work Adjustments



Basic adjustment:

Time: 12:00 o' clock

Switching times; Standard program:

UP: 07:00 o' clock

DOWN: 20:00 o' clock

Daily switching times; Weekly program

UP: 07:00 o' clock

DOWN: 20:00 o' clock

Common weekly switching times:

UP: 00:00 o' clock (deactivated)

DOWN: 00:00 o' clock (deactivated)

Accessories



**Light sensor
(Article No. 3720)**



**IR manual sender
(Article No. 9490)**



Suitable Switch programmms



Manu- facturer	Serie	Colour
Jung	LS 990 Stainless steel	white/alpin white stainless steel
Busch-Jaeger	impulse	alpin white/brilliant black
GIRA	Standard system Trias-Form Trias Facet Trias Gala S-Color System	creme white/pure white creme white/pure white/brown pure white creme white/brown/metallic pure white pure white/brown
PEHA	Dialog Tangenta	white/pure white pure white/grey white
Kopp	Vision Noblesse Rio Objekt 3000	arctic-white/brown/pearl white aranja/platinum brilliant white/antic-white brown/arctic-white

Guarantee conditions



Rademacher Geräte-Elektronik GmbH & Co. KG offers a **24 months guarantee** for new appliances mounted according to the mounting instructions. The guarantee covers all construction faults, material faults, and fabrication faults. Further claims, especially regarding the taking over of mounting and dismounting cost do not exist.

Not covered by the guarantee are faults and defects due to:

1. Defective mounting or installation
2. Non-observance of the mounting and operating instructions
3. Improper operating or stressing
4. External influences, f. ex. damages caused by shocks, impacts, or weather influences
5. Repairs and modifications executed by unauthorized third parties
6. Application of unsuitable accessories.

Defects occurring within the guarantee period are removed free of charge by Rademacher Geräte-Elektronik GmbH & Co. KG either by repairing or replacement of the corresponding parts. There is no prolongation of the original guarantee period in the case of compensation delivery for guarantee reasons.

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