metreco

MANUAL

Metreco HVAC MK2

English v1-4

Declaration of Conformity

This is to certify that this equipment, designed and manufactured by Panimpex NV, Slableedstraat 7, B-8630 Veurne, Belgium, meets the essential safety requirements of the European Union and is placed on the market accordingly. It has been constructed in accordance with good engineering practice in safety matters in force in the Community and does not endanger the safety of persons, domestic animals or property when properly installed and maintained and used in applications for which it was made.

- Equipment Description : Metreco, electronic wireless measurement device
- Applicable Directives : 2014/30/EU; 2014/35/EU; 2014/68/EU; 2014/53/EU
- CE Implementation Date : 14 September 2010
- Authorized Representative: Bernard Peirs, CEO

Any questions relative to this declaration or to the safety of Metreco products should be directed, in writing, to the support & quality assurance department at the above address.

Thank you for buying a Metreco!

Warnings & Dangers

-> Dangers and warnings indicated in this manual are marked with the following symbol: ⚠

- IP64 : dust tight & splashingwater tight = don't submerse or hold under tap upside down, can be used in the rain.
- Do not open in order to prevent electrocution.
- Repair & maintenance should be done by qualified personel.
- Warranty is void if you have attempted to open the product or dismantle it.
- Don't wet or short-circuit the battery charging contacts.
- For charging the batteries, only use the dedicated spaces in the charging station.
- Use only included AC adaptor for connecting the charging station to the mains.
- Use only included cigarette lighter plug for connecting the charging station to your 12V source (car etc.).
- Use only a USB 2.0 compliant cable (included) with the correct plugs to connect the handheld to the PC.
- If irradiance occurs of an electromagnetic field of 30 V/m at the frequencies of 325-340 MHz and 865-880 MHz, the wireless communication can get disturbed.
- Working temperature: -30..+70 °C (for optimal battery capacity: -20..+60°C).
- Load batteries 12h before first use.
- When stocking for longer period: keep the batteries at 50% charged.

Contact:
www.metreco.com T +32 58 42 14 50
info@metreco.com

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Metreco Concept

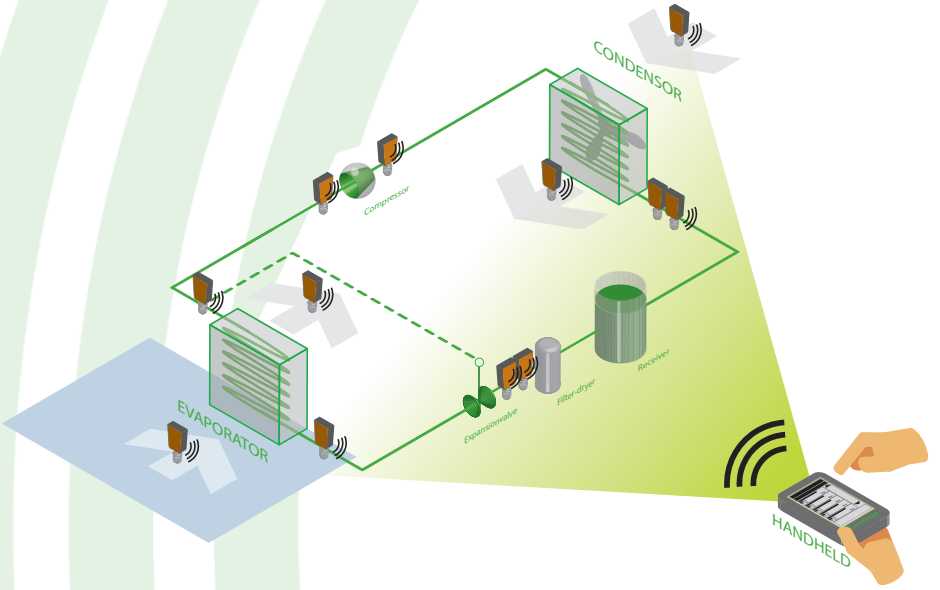
Thank you for choosing the Metreco Concept. This new way of working brings you on the edge of the most recent technological possibilities in wireless developments and gives you a huge competitive advantage.

SMART MOBILE MEASURING

- Dynamic measuring with METRECO, Smart Mobile Measuring, instead of static measuring with traditional manifold with hoses and temperature probes.
- Up to 20 sensors transmit their measurements simultaneously to the Handheld: no hoses - no lines.
- The user positions himself where he wants/walks around and can read out the measurements in real time.
- Intuitive/natural easy-to-use interface is operated with a capacitive touch-screen.

- Define your measurement/value targets - get a warning when they are off.
- Measurement - Diagnosis - Suggestions / Solutions.
- Database of serviced ACR systems available on Handheld & PC.
- Measurement reports on Handheld & PC.
- Intervention reports on Handheld & PC.

- Charge your handheld with the supplied charger and the sensor batteries with USB.
- Extra hoses and connectors for handling refrigerant.



• ***Scenario:***

Engineer Jason services a system of a new client who claims that it 'doesn't cool' any longer. He places the sensors on the system: low pressure, high pressure and the two temperature sensors. Jason has instantly, while walking around, access to the measurements in the 'All Sensors' menu.

He creates a new client and system through the touchscreen of the Metreco. He chooses a refrigerant and the targets for subcool, superheating and evaporator exit air temperature. He is now looking at the 'All Measurements' level and has an instant idea of the measured and calculated values. If one of the targets is off, he gets a warning with a diagnosis and a possible cause.

The measured values can be logged, this creates automatically a Measurement report. Jason also makes an Intervention report where he can keep track of the interventions he has done: leak detection, filter-dryer, refrigerant adjustment, oil test, pressure test, vacuum test, etc.

Back at the office Jason connects his Metreco handheld to his PC and makes a report for internal use and a customer report which is sent by e-mail.

Working with Metreco

1. Basics

Metreco is supplied with:

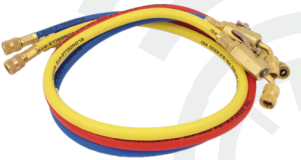
- 1 case
- 1 Low Pressure Sensor 20 Bar
- 1 High Pressure Sensor 50 Bar
- 2 Temperature sensors -50+150°C
- Metreco Handheld and charger
- USB cables for sensor charging
- Manual
- Set of hoses & connectors

Batteries

⚠ Batteries have to be charged during 12hours before first use!

- Charging batteries:
Handheld: connect the charger to the mains 230V(110V) AC.
Sensors: charge through USB (cable supplied, charger not supplied)

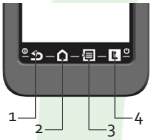
Hoses & Connectors



- 4 Hoses (1/4"SAE-1:4"SAE: Red, Blue, 2*Yellow)
- 2 R410A adaptors (1/4"SAE Male - 5/16"SAE Female)
- 1 X-connector (4* 1/4"SAE Male)
- 2 T-connectors (1/4"SAE Female – 2* 1/4"SAE Male)

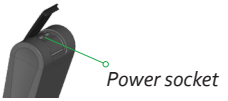
Handheld

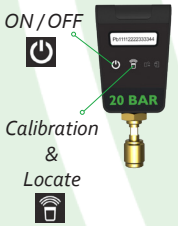
- *USB socket (for data connection only)*
- *5V DC Power plug*



ON	:	Swipe to the right (->) 1-2-3-4 (min 1 s)
OFF	:	Swipe to the left (<-) over 4-3-2-1
1 Back	:	back to preceding menu item
2 All Sensors	:	to 'All Sensors'
3 Main Menu	:	to 'Main Menu'
4 Logging	:	start/stop logging

Sensors





ON	:	Push the ⏻ button while the red LED flashes (2 s). Flashing slows down once activated.
OFF	:	Push the ⏻ button for at least 2 s while the red LED flashes quickly. Flashing stops when the sensor is Off.
Calibration	:	Calibration (see 5.2 Calibration)
Locate	:	Locate the sensor when assigning placement to system (see 'Step 10' in 4.1 ACR System Management)
Red LED	:	ON/OFF & Data sending
Green LED	:	Calibration (see 5.2 Calibration)

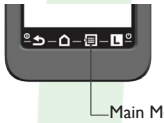
⚠ When your sensor has endured an overpressure of more than 2 times the max. pressure, you have to recalibrate your sensor. (see 5. Service & Support, Calibration and Updates)

2. Configuration

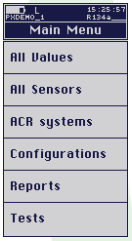
This is the list of parameters you can adapt:

- Units
- Language
- Log interval
- Date & Time
- Screen intensity
- Target Margins
- Update firmware (see 5.3.)

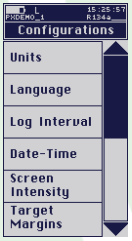
1. Go to 'Main Menu'.

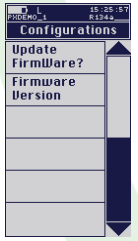


2. Select 'Configurations'.



3. Change the configurations as desired.

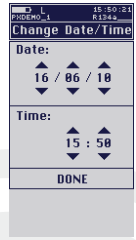




Units

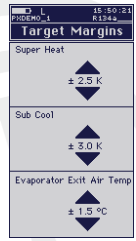
Language

Log interval
(go to '4.3. Logging')



Date and Time

Screen intensity



Target margins

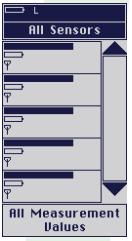
⚠ Modifying the target margins makes the Metreco more or less tolerant to target value variations = quicker or slower reaction of the warning pop-up.

3. Measuring

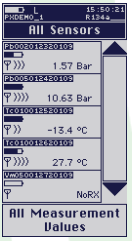
In this part you learn how to quickly measure a pressure, temperature or vacuum:

1. Turn the device ON, slide to the right on the shortcut buttons (during min 1 s).

2. You will see the 'All Sensors' screen.



3. Place the sensors (temperature, pressure, vacuum) on the system and turn them on by pressing at least for 2 seconds on the ⏻ button.
4. Observe the measured values.



In chapter '4. ACR' the following applications are treated:

- Creating a new ACR system
- Choosing an existing ACR system
- Diagnosis
- Logging
- Measurement report
- Intervention report
- Pressure Decay Test
- Vacuum Decay Test
- Follow-up on Metreco & PC
- Using the hoses & connectors
- Sensor calibration & firmware updates

4. ACR

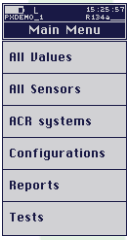
⚠ In order to correctly apply the treated subjects of this chapter, we strongly advise you to configure your handheld first (go to '2. Configurations').

4.1. ACR System management

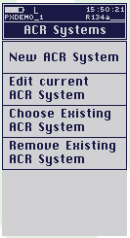
You can define and save ACR Systems on your Metreco.

1. Go to 'Main Menu'.

2. Choose 'ACR System'.

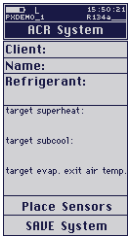


This menu gives you the possibility to:
- create a new ACR system
- choose an existing ACR system
- edit current ACR system
- remove an existing ACR system



- ***Create new ACR system***

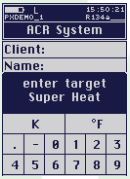
1. Choose 'New ACR System' and select 'Client'. Create a new one if needed or select an existing one.

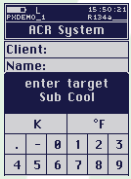


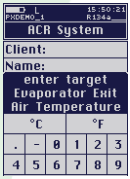
2. Choose 'Name' and complete the name you want to give to the system (a client can have many systems).

3. Select the refrigerant of the system.
-> This is an intelligent list. It will change the order of your refrigerants according to the frequency of selection of the refrigerants. Most selected refrigerants will go on top.

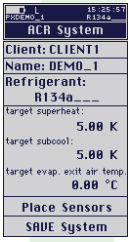
4. Determine the Superheat, Subcool and evaporator exit air temperature target.



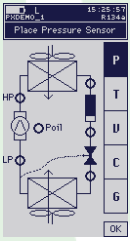


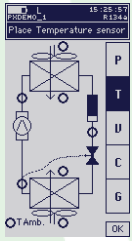


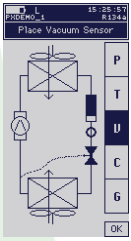
7. Assign the sensors, choose 'Place sensors' (If you haven't physically put the sensors on the system, put the sensors on the system).

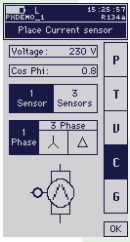


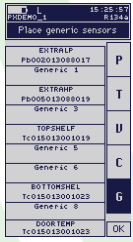
8. You have the possibility to assign pressure, temperature, vacuum sensors and amperage sensors. Or you can choose to give them a name in generic sensors:





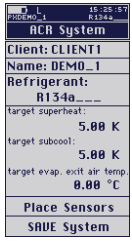






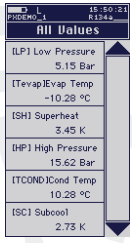
9. Select a spot on the system. You will get a list of available sensors eligible for this position and whose signal is received.
10. You can also press the locate button on the sensor. The sensor code will start blinking on the handheld.

11. When all sensors are assigned (*), select 'OK' in the right bottom corner. This will give you the 'ACR Sytem' again.



12. Select 'Save System' when all data is correct. The system is saved. You get the 'All Values' menu with all the measured and calculated values (You will get a warning if you didn't select or create a system.).

Warning



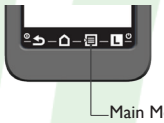
'All Values'

(*) (Sensors can only be assigned on a defined ACR system.)

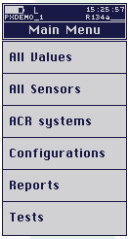
- ***Choose existing ACR system***

If you have created and saved ACR systems, you can choose a system in your list of clients and their systems. By choosing this, the placement of the sensors of your current system will be lost.
All the necessary data is available, you don't have to re-enter the data at each service:

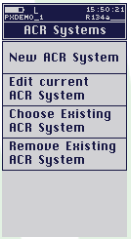
1. Go to 'Main Menu'.



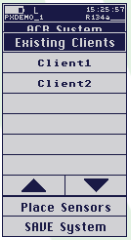
2. Select 'ACR System'.



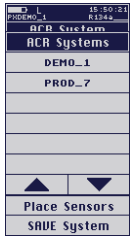
3. Select 'Choose Existing ACR System'.



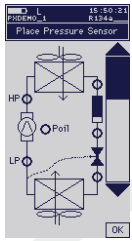
4. Select the customer whose system you are servicing.

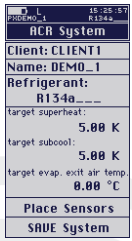


5. Select the ACR system.

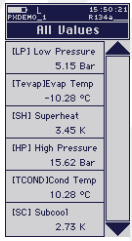


6. Change the data if necessary.
7. Check the targets.
8. 'Place sensors' & 'OK'.
9. 'Save system'.





10. Observe the measured values in 'All Values'.



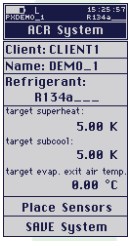
11. Consult Diagnosis. (see 4.2.)
12. Use the measured values in a Measurement Report. (see 4.3.)

• *Edit current ACR system*

If you have created and saved ACR systems, you can modify the data. The main idea is to change the placement of the sensors while servicing.

1. Repeat 'Choose existing ACR system' till step 3 if you have chosen the system or till step 5 if you still need to choose the system.

2. Change refrigerant if needed.
3. Change targets.



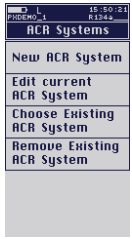
4. Change the placement of the sensors. By selecting a placed sensor you can undo it's placement and assign it on a different spot. (system can be saved without sensors being placed).
5. Confirm with 'OK'.
6. 'Save System'.

7. Continue your working procedure in 'All System Values' and obeserve the measured values while walking around.

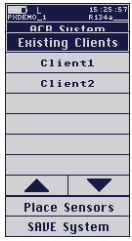
• *Remove existing ACR system*

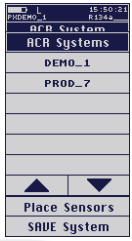
Saved systems can be removed (deleted):

1. Select 'Remove Existing ACR System'.



2. Select a client.
3. Select the system you want to remove.





4. Confirm removal of system.

Entire clients can only be removed on PC.

4.2. Performing measurement and diagnosis

- ***Measurements***

Measurements, measured and calculated (in 'All System Values'), can be performed from the moment sensors are placed physically onto the ACR system. The sensors also need to be 'placed' on an existing system in Metreco. ('ACR System' - 'Place Sensors').

By combining different sensors, e.g. pressure and temperature, extra values can be calculated.

This is the list of the different values that can be measured or calculated:

- LP	: Low pressure	(measured)
- Tevap	: Saturated Evaporation temperature (refrigerant)	(calculated)
- SH	: Superheat	(calculated)
- HP	: High pressure	(measured)
- Tcond	: Saturated Condensation temperature (refrigerant)	(calculated)
- SC	: Subcool	(calculated)
- POIL	: Oil pressure	(measured)
- LT	: Temperature low pressure side	(measured)
- HT	: Temperature high pressure side	(measured)
- TACONDIN	: Air temperature at condensor inlet	(measured)
- TACONDOUT	: Air temperature at condensor outlet	(measured)
- DTAcond	: Temperature Delta of air over condensor	(calculated)
- TAEVAPIN	: Air temperature at evaporator inlet	(measured)
- TAEVAPOUT	: Air temperature at evaporator outlet	(measured)
- DTAevap	: Temperature Delta of air over evaporator	(calculated)
- PCONDOUT	: Pressure at condensor outlet	(measured)
- DPcond	: Pressure Delta over condensor	(calculated)
- PFILTOUT	: Pressure at filter outlet	(measured)
- DPfilt	: Pressure Delta over filter	(calculated)
- PEVAPIN	: Pressure at evaporator inlet	(measured)
- DPevap	: Pressure Delta over evaporator	(calculated)
- PVAC	: Vacuum pressure	(measured)

- Values that don't have a sensor assigned show 'no sensor'.
- Calculated values which can't be calculated due to missing sensor show what value they are missing
- Values that are available are shown at the top of the list.

When saving a system, the placement of the sensors is not saved, this is a dynamic process. (see '4.6. A word on Sensor Placement')

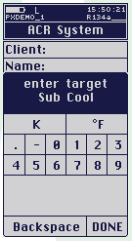
• ***Diagnosis***

In this chapter you will learn how to use the diagnosis tool. Metreco can suggest possible causes (*) for off-target measurements.

First of all you will need to define targets for the following measurements:

1. Choose an ACR system (see 4.1.).
2. Define the 3 targets and select 'Done'.

Superheat



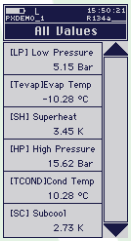
Subcool

Evaporator exit air temperature

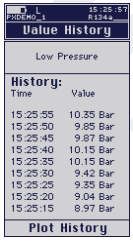
3. From now on you will get a warning if a value is off-target.
4. Select 'OK' to continue or 'Value' to check the off-target value.

Check the dynamic history of every measured and calculated value and its divergence to the defined target on your Metreco Handheld. Per sensor, the last 10 measured values are shown.

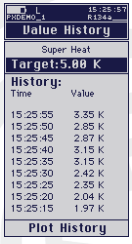
1. Select a value in 'All Values'.



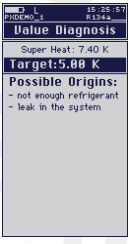
2. You will get a history of this value. If the value has a defined target you can consult a diagnosis (*) with possible causes.
3. By selecting 'Plot history' the data will be plotted on the screen.



History



History with target



Diagnosis (*)

(*) This is a non-limited list that serves only as an indication. The engineer has to make his own diagnosis and has to be in possession of the certificates mandatory by law and the knowledge to service ACR systems.

4.3. Logging & Reports

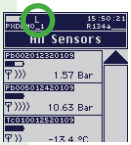
- Logging data creates a logfile (.csv) and a Measurement Report
- Pressure Decay Test creates a logfile (.csv) and a Pressure Decay Test Report (long & short)
- Vacuum Decay Test creates a logfile (.csv) and a Vaccum Decay Test Report (long & short)

• *Logging*

When you apply 'logging', the measured values will be memorised with a standard interval of 5 seconds. This data can be used in Measurement Reports. You're getting a list of saved data (time & value) that you can retrieve from the Metreco on your PC via USB. This can then be used for technical or commercial purposes (see '4.5. Customer & Systems follow-up').

⚠ The standard interval between 2 loggings is 5 seconds. You can modify this interval in the configuration menu (see '3. Configuration').

1. Select 'Logging' to start the logging process. The logging icon 'L' will start blinking.
2. Select 'Logging' again to end the process. The logging icon 'L' will stop blinking.



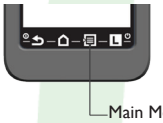
When you end the logging process, a new Measurement report with the last logged measured values is automatically created (see next point -> Measurement Report), all the logged values are saved in a 'LOG' file (.csv).

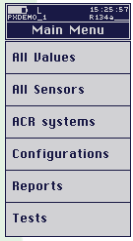
There are over 1.000.000.000 data points...

• ***Measurement Report***

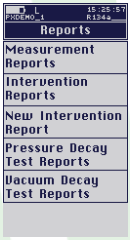
- A Measurement Report is a survey of the performed measurements that you can use for technical and commercial purposes.
- A Measurement Report gives you the last logged measured values before ending the logging. The report is saved automatically when ending the logging and can be recalled on Metreco and downloaded on PC for later use in internal reports or reports to your customer.

1. Follow the 'Logging' procedure as explained in the preceding paragraph.
2. Select 'Reports' in the 'Main Menu'.

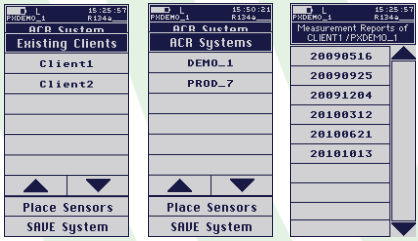




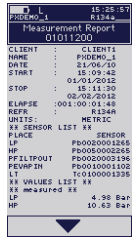
3. Select Measurement Reports.

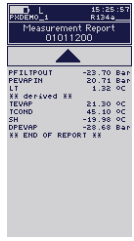


4. Select the customer, system and report.

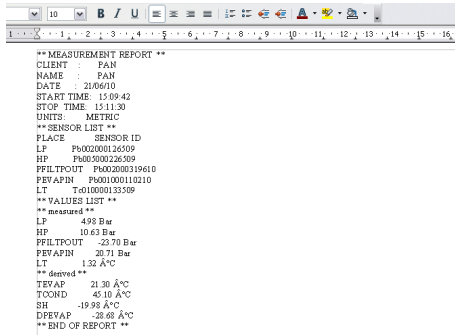


5. The Measurement Report contains a summary of:
   - customer data
   - system data
   - placed sensors
   - measurements





on Metreco



```
** MEASUREMENT REPORT **
CLIENT      : PAN
NAME        : PAN
DATE        : 21/06/10
START TIME  : 15:09:42
STOP TIME   : 15:11:30
UNITS       : METRIC
** SENSOR LIST **
PLACE       SENSOR ID
LP          Pb0020001265 09
HP          Pb0050002265 09
PFILTPOUT   Pb0020003196 10
PEVAPIN     Pb0010001102 10
LT          Tc0100001335 09
** VALUES LIST **
** measured **
LP          4.98 Bar
HP          10.63 Bar
PFILTPOUT   -23.70 Bar
PEVAPIN     20.71 Bar
LT          1.32 °C
** derived **
TEVAP       21.30 °C
TCOND       45.10 °C
SH          -19.98 °C
DPEVAP      -28.68 °C
** END OF REPORT **
```

on PC (see '4.5. Customer & Systems follow-up')

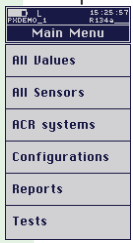
metreco
smart mobile measuring

- ***Intervention Report***

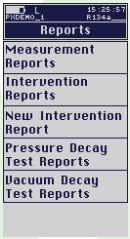
In the Intervention Report you can save data on the servicing you have done and recall the data on Metreco or use it on your PC:

- Leak detection (leak detector & result)
- Vacuum decay test (possibility to store the vacuum sensor value)
- Pressure test with N2 or N2H2 (possibility to store the pressure sensor value)
- Refrigerant changes: recovered & charged
- Filter-dryer replaced?
- Oil test
- Refrigerant acid test & refrigerant moisture test
- Time spent on the job
- Notes

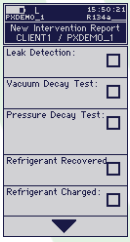
1. Select a system (see 4.1.). Intervention Reports can only be made when an 'ACR system' is selected.
2. Select 'Main Menu' and select 'Reports'.



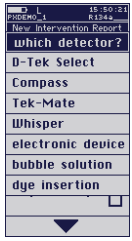
3. Select 'New Intervention Report'.

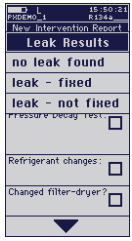


4. Select 'Leakdetector'.



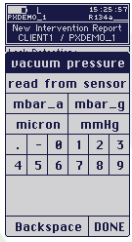
5. Select 'Leak detector type' and the result.



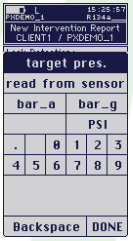


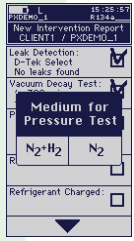
6. Select 'Vacuum Decay Test' .
7. Choose manual input or an existing report (see '4.4. Tests'). When choosing manual input, enter the measured value OR take a live read-out from your vacuum sensor, if placed on the installation and assigned in Metreco (vacuum sensor not incl.).

8. Enter evacuation time.

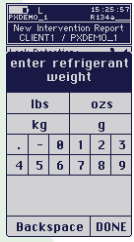


9. Select 'Pressure Decay Test'.
10. Choose manual input or an existing report (see '4.4. Tests'). When choosing manual input, enter the measured value OR take a live read-out from your vacuum sensor, if placed on the installation and assigned in Metreco.
11. Select the used gas (N2 or N2+H2)

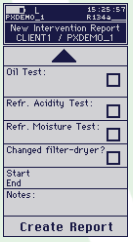


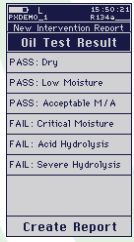


12. Select 'Refrigerant Recovered' and enter the quantity.
13. Select 'Refrigerant Charged' and enter the quantity.



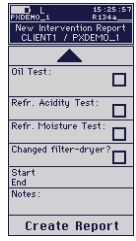
14. Scroll downwards.
15. Select 'Oil test' and enter the result.

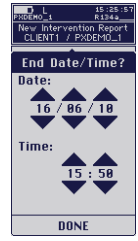




16. Select 'Acid test' and enter the result.
17. Select 'Moisture test' and enter the result.

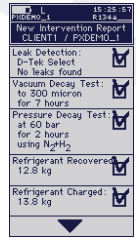
18. Select 'Start/End' and complete.

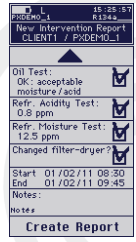


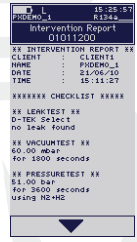


19. Select 'Notes' and add remarks.

20. Example of an Intervention Report on Metreco (for use on PC see4.4.).







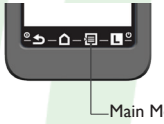
- Not all data has to be entered to create an Intervention Report.
- You will find more explanations on the use of Reports on PC in the next chapter (4.5.).
- Recalling an Intervention Report is similar to recalling a Measurement Report (4.3.).

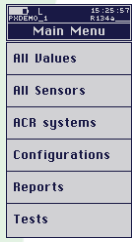
4.4. Tests

• *Pressure Decay Test - PDT*

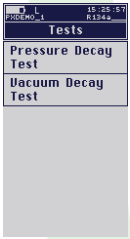
The pressure decay test gives you the possibility to follow up and log the legaly imposed pressure test. There is the possibility to automatically compensate the pressure for temperature variations. A temperature and pressure sensor are what you need for this test.

1. Select 'Main Menu' and select 'Tests'.

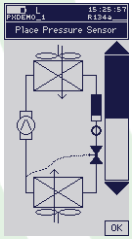


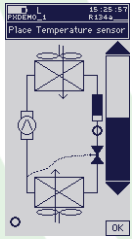


2. Select 'Pressure Decay Test'.

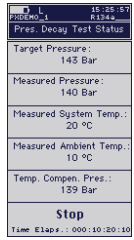


3. Complete the Pressure Decay Test Setup.
You must assign a pressure sensor
You are free to choose to assign a:
- System Temperature sensor
- Ambient Temperature sensor
- Target Pressure
- Pressure Medium (N2 or N2H2)

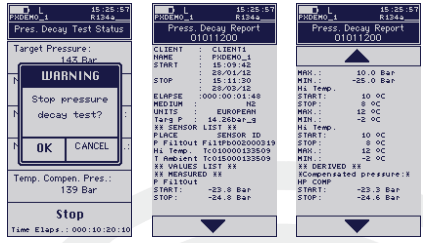




4. Press 'Start'
You get the Pressure Decay Test Status



5. End the PDT by pressing 'Stop'.
You get the report.



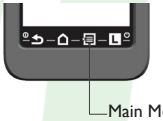
6. Consulting the PDT:
- on the handheld can be done similarly as a Measurement Report.
(See 4.3 - Measurement Report)

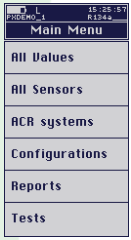
- on the PC can be done similarly as a Measurement Report & Logfile.
(See 4.5 - Follow-up on PC)

• *Vacuum Decay Test - VDT*

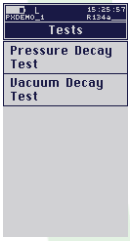
The vacuum decay test gives you the possibility to follow up and log the legaly imposed Vacuum test.
This test is separted in 2 stages:
- Evacuation
- Vacuum Decay Test

1. Select 'Main Menu' and select 'Tests'.

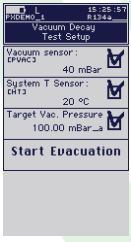


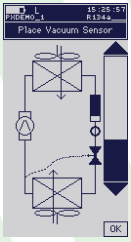


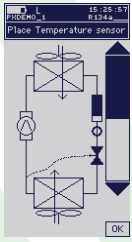
2. Select 'Vacuum Decay Test'.



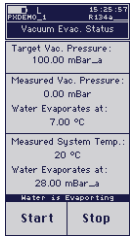
3. Complete the Vacuum Decay Test Setup.
You must assign a vacuum sensor
You are free to choose to assign a:
- Temperature Sensor for the System Temperature
- Target Vacuum Pressure







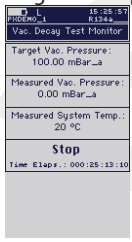
4. Press 'Start Evacuation'
You get the Vacuum Evacuation Status



When water is evaporating, this will be shown.

5. When the wanted target vacuum is achieved, stop de evacuation and start the VDT by pressing 'Start'.

6. End the VDT by pressing 'Stop'.
You get the report.



7. Consulting the VDT:
- on the handheld can be done similarly as a Measurement Report.
(See 4.3 - Measurement Report)
- on the PC can be done similarly as a Measurement Report & Logfile.
(See 4.5 - Follow-up on PC)

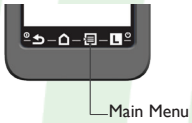
metreco
smart mobile measuring

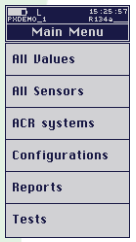
• *Coeffient Of Performance Test - COP*

The COP test allows you to measure the energy efficiency of your system.
Following data is recorded:

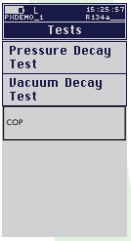
- COP: Current, Min/Max, AVG
- Cooling Capacity: Current, Min/Max, AVG
- Ambient Temp.: Current, Min/Max, AVG.
  For measuring the Seasonal COP

1. Select 'Main Menu' and select 'Tests'.

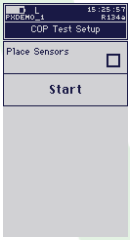


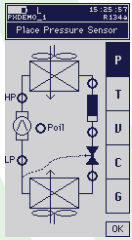


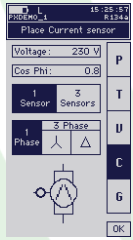
2. Select 'COP Test'.



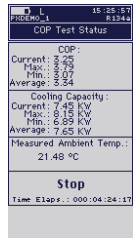
3. Complete the COP Test Setup.
You must assign at least 2 pressure sensors and 3 temperature sensors. A third pressure sensor is needed if your refrigerant has glide. You can add Amperage sensors and a temperature sensor for ambient temperature.







4. Press 'Start'
You get the COP Status



5. When stopping you get a .csv file and the following report:

4.5. Customer & Systems follow-up

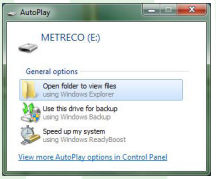
- Logging data creates a logfile (.csv) and a Measurement Report
- Pressure Decay Test creates a logfile (.csv) and a Pressure Decay Test Report (long & short)
- Vacuum Decay Test creates a logfile (.csv) and a Vaccum Decay Test Report (long & short)

- ***Follow-up on Metreco***
  (See Chapter 4.3. Logging & Reports)
  - Measurement Report
  - Intervention Report
  - Pressure Decay Report
  - Vacuum Decay Report

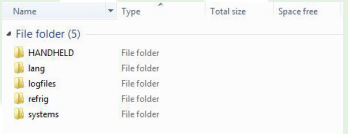
- ***Follow-up on PC***
  - Measurement Report & Logfile
  - Intervention Report
  - Pressure Decay Report & Saved data
  - Vacuum Decay Report & Saved data

Reports and logfiles can be retrieved from Metreco and downloaded on your PC. This data can by used in (e.g.): a technical report for your customer, a review of the perfomed servicing (keeping track in an ERP system), a detail of an invoice, follow-up of your F-GAS files, etc.

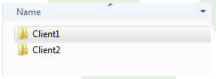
1. Switch on your Metreco and connect to your PC with the included USB-cable.
2. Select 'Open folder to view files using ...'



3. You get 5 folders:
   - handheld: data-file (not for manipulation)
   - lang: all languages
   - logfiles: data-file (not for manipulation)
   - refrig: all refrigerants
   - systems: all systems sorted by client

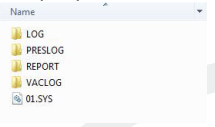


4. Select the 'Systems' folder. You get all your clients.
5. Select a 'Customer/Client'.



6. Select the 'System'.

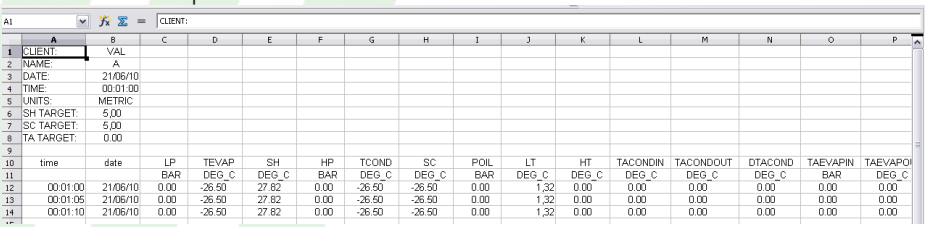
7. This gives you:
   - folder with reports
   - folders with logfiles
   - .sys system file (not for manipulation)



8. You can select the:
   - LOG (logfiles)
   - VACLOG (Vacuum Decay Test logfile)
   - PRESLOG (Pressure Decay Test logfile)

select the type of logfile you want to use. Select the logfile, date & n° are included in filename.

9. This is a .CSV-file that can be opened using any conventional spreadsheet program. You can use the data in a report.

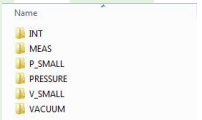


	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	CLIENT:	VAL														
2	NAME:	A														
3	DATE:	21/06/10														
4	TIME:	00:01:00														
5	UNITS:	METRIC														
6	SH TARGET:	5,00														
7	SC TARGET:	5,00														
8	TA TARGET:	0,00														
9																
10	time	date	LP	TEVAP	SH	HP	TCOND	SC	POIL	LT	HT	TACONDIN	TACONDOUT	DTACOND	TAEVAPIN	TAEVAPOI
11			BAR	DEG_C	DEG_C	BAR	DEG_C	DEG_C	BAR	DEG_C	DEG_C	DEG_C	DEG_C	DEG_C	BAR	DEG_C
12	00:01:00	21/06/10	0.00	-26.50	27.82	0.00	-26.50	-26.50	0.00	1,32	0.00	0.00	0.00	0.00	0.00	0.00
13	00:01:05	21/06/10	0.00	-26.50	27.82	0.00	-26.50	-26.50	0.00	1,32	0.00	0.00	0.00	0.00	0.00	0.00
14	00:01:10	21/06/10	0.00	-26.50	27.82	0.00	-26.50	-26.50	0.00	1,32	0.00	0.00	0.00	0.00	0.00	0.00

Accessing the
- Measurement
- Intervention Reports
- Pressure Decay Test Report (long & short version)
- Vacuum Decay Test Report (long & short version)

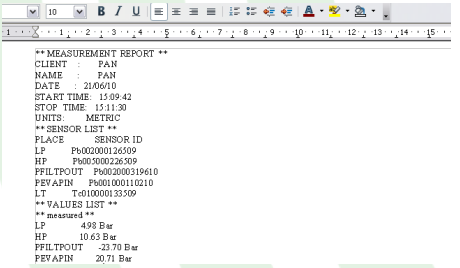
-> repeat step 1 to 6.

7. Select 'REPORT'.
8. Select the wanted report type.



9. Select the wanted report.

10. The reports can be opened using any conventional word processor. Click right and choose 'Open with' and select your software.



```
** MEASUREMENT REPORT **
CLIENT   :   PAN
NAME     :   PAN
DATE     :   21/06/10
START TIME:  15:09:42
STOP TIME:   15:11:30
UNITS:       METRIC
** SENSOR LIST **
PLACE        SENSOR ID
LP           Pb002000126509
HP           Pb005000226509
PFILTPOUT    Pb002000319610
PEVAPIN      Pb001000110210
LT           Tc010000133509
** VALUES LIST **
** measured **
LP           4.98 Bar
HP           10.62 Bar
PFILTPOUT    -23.70 Bar
PEVAPIN      20.71 Bar
```

11. Use the data for:
- communicating with your customer (technical & commercial)
- keeping track of the performed work and servicing in an ERP system
- follow-up of your F-GAS files
-....

4.6. A word on Sensor Placement

- ***Placing a sensor***

Sensors can be placed when defining the system (see 'step 8' in '4.1. ACR System Management') and when setting up a Pressure or Vacuum Decay Test (see 'step 3' in '4.4. Tests').

The placement of the sensors is dynamic. This means that when switching to a different system your placement will be lost.

- ***Sensor out of range***

If your sensor is out of range:
- all arrows will have disappeared in the reception area of that target sensor in the 'All Sensors' screen. (see 'step 4' in '3. Measuring')
- during the following 30 seconds the last measured value will be shown
- during the next 2 minutes your sensor value on the 'All Sensors' screen will show 'RF Lost'
- after this your sensor will be lost from its placement
- in the logfiles the loss will be shown, but the collum will be kept

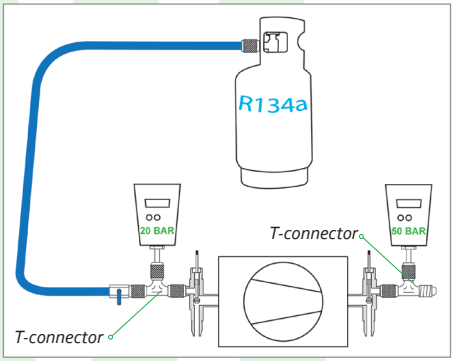
Regain reception by extending the range with a 'Repeater'.

4.7. How to use the hoses & connectors?

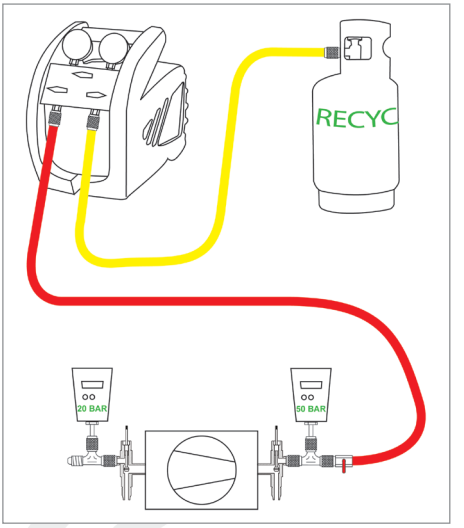
Use the hoses and connectors for filling, removing and handling refrigerant.

- 4 Hoses (1/4"SAE-1:4"SAE: Red, Blue, Yellow) (1/4"SAE-3/8"SAE: Yellow)
- 2 T-connectors (1/4"SAE Female - 2* 1/4"SAE Male)
- 1 X-connector (4* 1/4"SAE Male)
- 2 R410A adaptors (1/4"SAE Male - 5/16"SAE Female)

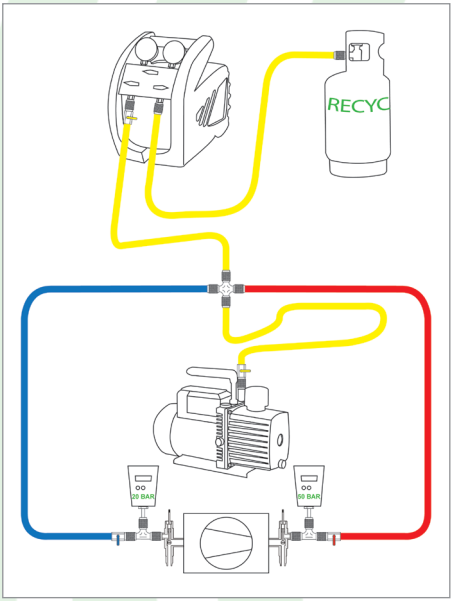
• ***Fill refrigerant***



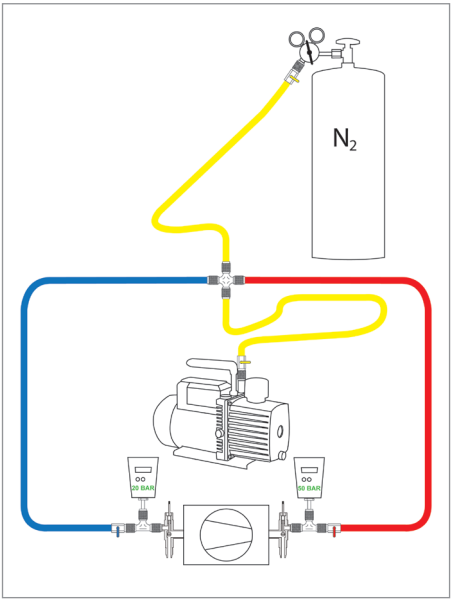
• ***Remove refrigerant***



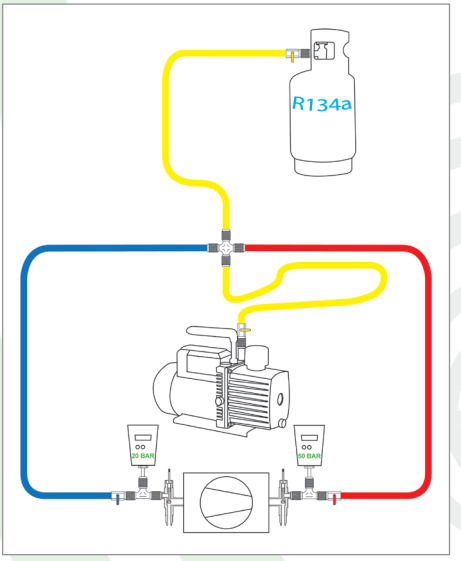
• ***Evacuation 1***



• ***Evacuation 2***



• ***Evacuation 3***



5. Service & Support, Calibration and Updates

5.1. Service & Support

For all your questions and remarks on use, maintenance and service and for all your suggestions on Metreco, please contact:

- info@metreco.com
- +32.58.42.14.50

This manual is also digitally available on:

- www.metreco.com/support (log-in required, follow instructions)

5.2. Calibration

We advice you to, in the spirit of the F-GAS, have your sensors tested and calibrated yearly. You can perform the sensor calibration yourself if you have the necessary calibration equipment and if your authorised by your national law. The calibration procedure is to be found on:

- www.metreco.com/support (log-in required, follow instructions)

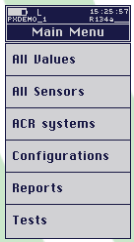
Or you can choose to let us do the sensor calibration, contact:

- calibration@metreco.com

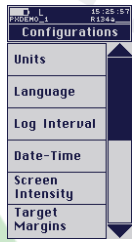
⚠ In case of an overpressure of more than 2x the maximum pressure of the sensor, the sensor has to be calibrated.

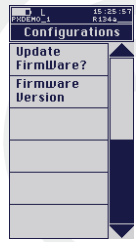
5.3. Firmware updates

1. Go to www.metreco.com/support (log-in required, follow instructions).
2. Sign in if this is your first time or Log in with your login (e-mail adress) and password.
3. Download the update file if this is a higher version than the one you have on your Metreco (see step 5 below).
4. Go to 'Main Menu' and select 'Configurations'.

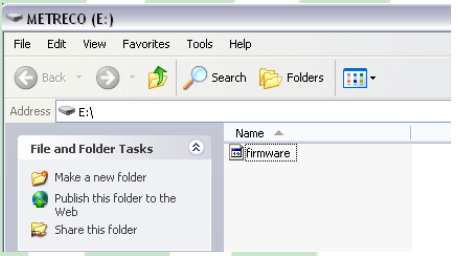


5. Scroll downwards and select 'Update Firmware'; confirm with 'OK'. Here you will get the firmware version.





6. You have 10 s to connect your Metreco to your PC with the included USB-cable.
7. Follow the instructions on your Metreco, this is what you will get on your PC:



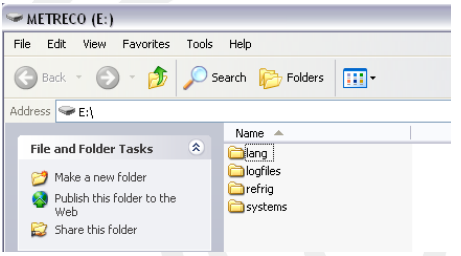
8. Remove the .BIN file.
9. Drag the file you downloaded in 'step 3' in this folder.
10. Close this window and disconnect your Metreco.
11. Your Metreco is updating, you get a warning on your Metreco.

-> The firmware on your Metreco has been updated and the handheld is ready to use.

5.4. Extra Languages and Refrigerants

Extra languages and refrigerants are available on the Metreco website.
1. Go to www.metreco.com/support (log-in required, follow instructions).
2. Download the languages and refrigerants of your choice.
3. Connect the Metreco to your PC with the included USB-cable.
4. Select 'Open folder to view files using ...'

5. Drag the downloaded file(s) in the dedicated folder. Langauges in 'lang' and refrigerants in 'refrig'.



6. Close the window and remove the USB-cable safely.
7. The uploaded langauges and refrigerants are now available in Metreco.

Technical data

• *Metreco Handheld*

Code: HH02ST
Name: Standard Metreco Handheld with charger
Autonomy Back-light 100%: 10,5h
Autonomy Back-light off (0%): 15,5h
Autonomy OFF: >200h
Battery: LiPo (Lithium Ion Polymer)
Wireless range: min. 200m (open air)
Protection: IP64 with cap closed

• *Sensors*

- 20 bar
Code: Pb0020M14S-C
Name: 20 Bar pressure sensor, USB charging
Range: -1+20 bar
Precision: Class 0,5 (0,5% FS)
Overpressure: 40 bar
Burst overpressure: 70 bar
Autonomy ON: >180h (>7days)
Autonomie OFF: >1,5 year
Battery: LiPo (Lithium Ion Polymer)
Wireless range: min. 200m (open air)
Protection: IP64 with cap closed

- 50 bar
Code: Pb0050M14S-C
Name: 50 Bar pressure sensor, USB charging
Range: -1+50 bar
Precision: Class 0,5 (0,5% FS)
Overpressure: 100 bar
Burst overpressure: 150 bar
Autonomy ON: >180h (>7days)
Autonomie OFF: >1,5 year
Battery: LiPo (Lithium Ion Polymer)
Wireless range: min. 200m (open air)
Protection: IP64 with cap closed

- Temperature
Code: Tc0150PV-C
Name: Temperature sensor, USB charging
Range: -50+150°C
Precision: 0.5°C
Autonomy ON: 119h (<5days)
Autonomie OFF: >1,5 year
Battery: LiPo (Lithium Ion Polymer)
Wireless range: min. 200m (open air)
Protection: IP64 with cap closed

(-Sensors and handheld are equiped with LiPo batteries. LiPo batteries have the advantage that they are light, have a greater charging capacity and no memory effect.)

Spare parts

- MT02ST	: Metreco HVAC MK2: standard complete Metreco Set
- KN02ST	: Kit Vacuum: absolute vacuum sensor + valve core remover (shraeder)
- KC02ST	: Kit CO_2 Transcritical: 100Bar & 200Bar pressure sensors + hoses
- KV02ST	: Kit NH_3: 20bar & 50Bar pressure sensors with Stainless steel couplers & hoses
- HH02ST	: Metreco handheld standard with charger
- Pb0020M14S-C	: -1..20 bar pressure sensor, messing 1/4"SAE female, USB charging
- Pb0050m14S-C	: -1..50 bar pressure sensor, messing 1/4"SAE female, USB charging
- Pb0020i14S-C	: -1..20 bar pressure sensor, stainless steel 1/4"SAE female, NH_3, USB charging
- Pb0050i14S-C	: -1..50 bar pressure sensor, stainless steel 1/4"SAE female, NH_3, USB charging
- Pb0100M14S-C	: -1..100 bar pressure sensor, messing 1/4"SAE female, CO_2 Transcritical LP, USB charging
- Pb0200M14S-C	: -1..200 bar pressure sensor, messing 1/4"SAE female, CO_2 Transcritical HP, USB charging
- Vm1000M14S-C	: absolute vacuum gauge, precision 0,5%, USB charging
- Tc0150PV-C	: -50..150°C temperature sensor, Velcro, USB charging
- DS02ST	: standard Metreco case
- MA02ST	: standard accessories for Metreco: hoses, couplers, adaptors, USB-cable
- S41B12-150	: red hose, 1/4"SAE-1/4"SAE with ball-valve; 1,5m; teflon; 55Bar
- S41B13-150	: blue hose, 1/4"SAE-1/4"SAE with ball-valve; 1,5m; teflon; 55Bar
- S41B14-150	: yellow hose, 1/4"SAE-1/4"SAE with ball-valve; 1,5m; teflon; 55Bar
- AC0107-8101	: T-connector 1/4"SAE female with swivel and 2x 1/4"SAE male with shrader depressor
- AC0107-8102	: X-connector 4x 1/4"SAE male
- AC0107-7410	: adaptor 1/4"SAE – 5/16"SAE
- AC0107-8104	: USB cable: USB A – miniUSB B
- AC0107-8106	: 230V wall charger, europe

metreco

smart mobile measuring

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