Prisma DI

DI-5C

MANUAL

INSTRUMENT

PRISMATIBRO

INDEX

Facts 3
- Tolerance
- How to achieve optimum results

Magnet 3
Safety instructions 3
Troubleshooting 3
Maintenance 3
- Calibration
- Change Transducer tip

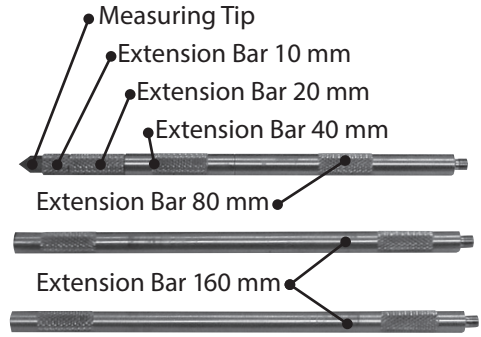
How to use the instrument 4-8
- Description 4
- Display 4
- On/Off & push buttons 5

Settings 5
- Set date and time
- Change number of digits
- Change limit value
- Change program mode

Measuring crankshaft deflection 6-8
- Print documents
- Store documents
- Find stored documents
- Edit documents
- Read documents
- Delete documents
- Battery charge

Data transfer to PC 8
Cylinder liner measurement 9
Spare parts list 9
Flow chart 10-11

INSTRUMENT OVERVIEW



FACTS ABOUT DI-5C

Prisma DI

Tolerance

Prisma DI-5C has a tolerance of max. 0.006 mm in the range of +/- 0.500 mm, max 1% in the range of +/- 0.500-1.000 mm and max 2% in the range of +/- 1.000-2.000 mm.

How to achieve optimum results

An accurate measurement result can be achieved if both transducer and the measured object (Crankshaft) are having the same temperature so that the transducer temperature is not changed during the measurement.
If the transducer's temperature differs from the measured object (Crankshaft) temperature, an error value of approximately 0.002mm/°C can be experienced.
That's why the transducer should as far as possible, be temperature-acclimatized to the measured object (Crankshaft) temperature before starting with the measurement.

MAGNET

It's very necessary to use the magnet which is attached to the cable. It helps keeping the cable stable during the measurement and accordingly an accurate measurement results can be achieved.

SAFETY INSTRUCTIONS

- Be careful with tools that may cause short circuit at the battery charge port.
- Make sure to use only the original charger supplied with the DI-5C.

TROUBLESHOOTING

- If the display is lighting up without any readings then please press on the "POWER" button for 3 seconds to switch off the device and try to start it again.
- If the DI-5C is not used for a long time or not being charged for at least once a year then it may be difficult to start up the device and accordingly a battery reset can probably help to have the DI-5C up and running again.

  To reset the battery please do as follow

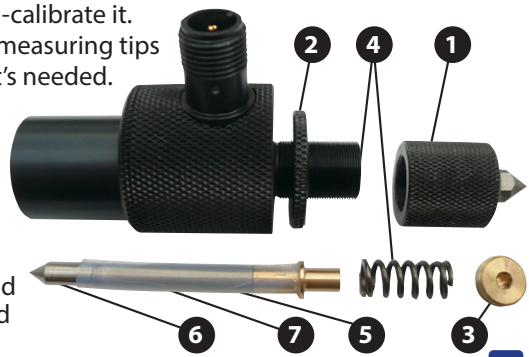
  1. Remove the left cover of the display unit.
     The cover which includes the battery charge port.
  2. Pull out the battery contact and put it back again, the display will start up and go down again.
  3. Remount the left cover

MAINTENANCE

- The calibration certificate supplied with the DI-5C is valid for 3 years. Please contact us if you would like to re-calibrate it.
- Make sure that the extension bars and measuring tips are in good condition and replace it if it's needed.

Change Transducer tip

1. Remove adjusting sleeve 1 and locking ring 2
2. Unscrew the brass nut 3
3. Pull out the spring 4
4. Pull out the complete tip unit
5. Remove the teflon cover 5 if mounted
6. Unscrew the tip 6 from the core 7 and mount the new transducer tip
7. Remount in opposite order



HOW TO USE THE INSTRUMENT

DESCRIPTION

The importance of accurate crankshaft deflection measurement can´t be enough emphasized. The DI-5C series of instruments are designed to be both accurate, fast and user friendly. The complete instrument set is stored in a customized carrying case which includes Main instrument, Battery Charger, Transducer, Connecting cable, Extension bars, Measuring tip, Program Manual and User Manual.

The DI-5C is a robust construction, however, it is also a high precision measuring instrument and should be handled with care.

The TRANSDUCER is the measuring device and must be connected to the instrument with the special cable, length approximately 7m/20ft or 3.6m/11.8 ft

Extension bars are included in lengths of 10, 20, 40, 80 and 2 x 160 mm. The transducer with measuring tip has a minimum measuring distance of 89 mm. The many extension bars allow for measuring any distance between (min) 89 to (max) 565 mm. An optional transducer for down to 60 mm web distance is available, however, the Ovality Kit accessory cannot be used together with it.

All selections, information and value parameters shown on the display are accepted by pressing the 'OK' button. Change values by pressing the **left <** and **right >** arrow buttons. Study the Flow scheme (chapter 5) carefully, it illustrates the various steps. Each step is described in text below.

DISPLAY

The user procedures are menu based and information/values are presented in the display window.
There are two display rows, each row has a capacity of 12 letters, numbers or blanks.
The display can be illuminated by a back light and the illumination can be adjusted in ten steps.
When batteries go low on power, a battery indicator shows the need for charging.
For battery charge see section BATTERY CHARGE, page 8.

NOTE 1

If the DI-5C is not used for a long time, then it´s necessary to charge the battery at least once a year.

NOTE 2

Don't use the charger as a power supply.
It's only for charging the Li-Ion battery.

ON/OFF, PUSH BUTTONS

OK

To START the instrument, press OK.
The OK button is used to accept throughout the step by step procedure.
To SWITCH OFF the instrument, press and hold OK for 3 seconds or , when in date/time mode, press < twice to reach the menu alternative SWITCH OFF INSTRUMENT? Accept by pressing OK.

<

Used to change value or position

>

Used to change value or position

^

This button allows you to step backwards in the menu if you should enter and accept OK by mistake.

SETTINGS

Set date & time

Date and time are continuously displayed when the instrument is switched on and controlled by an internal clock. If the battery runs empty it might be necessary to re-enter actual time and date. Date is written YY-MM-DD (Year, Month, Date). Time is entered using a 24 hour clock (no AM/PM). The date format can then be changed into US format (MM-DD-YY) if desired.

Change number of digits

The display is normally set 3 decimal numbers (i.e. 1/1000 mm) on the display = 4 digits. It is possible to select 2 decimal numbers = 3 digits.

Change limit value

Red and Green indicators are located on the instruments front panel to assist measurement. The measurement limits are normally set +/- 0.500 mm. Measurements taken within this range will show a steady green LED. Should it exceed these limits the Red LED will go on. If you want to make a visual check only, the limits can easily be reduced to acceptable tolerances indicated with Green and Red.

Change program mode

When selecting STANDARD MODE by OK, the program (menu) will follow the Flow Scheme on the last page.
If MEASUREMENT ONLY is selected the instrument will be switched to Prisma DI-5 mode which doesn't allow saving the measurements in the instrument while only displaying it.
NOTE ! In this mode the panel buttons operate in the following way;
OK = ON/OFF < = RESET > = ZERO SET ^ = BACKLIGHT on/off.
This mode will be switched back to STANDARD MODE upon re-starting the instrument.
Step to CHANGE PROGRAM MODE and change mode.

MEASURING CRANKSHAFT DEFLECTION

a) Make sure that the cable is properly connected to the instrument.
b) Select and assemble the required extension bar(s) to achieve the correct length, tighten firmly by hand and screw into the fine adjustment end of the transducer.
c) Push OK button. Date and time is shown on the display, accept by pushing OK.
d) Number of documents stored will appear on the display for 2 seconds (see section STORE DOCUMENTS, page 7).
e) A New Document will be given a new number consisting of 8 digits. The first two digits being sequential numbers followed by six date digits. Together these digits will form the new document number.
f) Accept crankshaft measurement by pressing OK
g) Select engine type with left/right arrows (< / >), or choose USER DEFINED. To accept press OK. When USER DEFINED is selected, the screen will show "1". Click > ("1" flashes slowly) and then OK to start text editor ("1" flashes fast). To produce your own engine ID, press the > button repeatedly until the first required letter/number appears, press OK, continue until ID is complete. Use ^ button for space. Should an error occur, use the < button to step backwards to correct it. Restart the process with the > button. When the last letter/number is entered, press OK three times to leave edit mode and go further to next level. To step backwards to previous menu you have to delete all letters with the < button to the first position, then press ^ button.
h) The screen will automatically display "Engine No 1", to accept press OK. Alternatively, to generate your own engine number, use arrow buttons as described above (g).
i) Select engine condition 'warm / cold', to accept press OK.
j) Enter correct temperatures (ambient, lubricating oil and cooling water) using arrow buttons. To accept each temperature, press OK.
k) Select clockwise / anti clockwise, press OK.
l) Enter the total number of cylinders (max 24) by using < > arrows, press OK.
m) Choose the cylinder you want to start with and press OK.
n) Accept RESET by pressing OK. This reset is to ensure that the instrument collect a true value from the transducer.
o) Fit the transducer between the crank webs in the punch marks and make sure to use the cable magnet which helps keeping the cable stable during the measurement. Use the adjusting thread until the instrument indicates between +/- 0.500 mm and preferably close to zero, then tighten it with the locking ring to maintain fixed length.
p) Set the instrument to ZERO by pressing OK.
q) Select position 'A' for clockwise rotation and 'E' if anti clockwise. With instrument reading 0,000 mm, rotate the crankshaft to next position and accept the reading by pressing OK. Continue through the remaining positions of rotation.
r) When all positions are complete, the instrument will display the next cylinder in line order, press OK to accept. Alternatively, should you wish to select any other cylinder number press < / > arrows, then OK.
s) To remove the transducer, apply pressure against the spring loaded tip of the transducer, this should allow the extension bar end to be freed from the web punch marks.

t) Fit to the next cylinder by compressing the spring loaded end of the transducer into the punch mark and relocate the bar end tip.
NOTE Normally it is not necessary to release the locking ring.

u) Accept a Reset with OK. Check that the display value is within +/ - 0.500mm but preferably close to zero, then press OK to to set the instrument to ZERO (0.000mm). Continue with this procedure until all cylinders are completed.

v) When the display reads "MEASURING DONE", press OK.
NOTE Before accepting "MEASURING DONE" you wish to re-measure a cylinder, return to that cylinder number using < / > buttons, press OK.
The display will read REMEASURE CYLINDER ?
Press OK and repeat the measuring sequence.

PRINT DOCUMENTS

When the measurement data have been transferred to the PC program it is possible to make printouts. See separate "Software Manual for PC".

STORE DOCUMENTS

All measuring data and information is stored when the OK button is pressed.
This data is fully retained, also when batteries are low or empty.
Memory capacity of the DI-5C allows 45 complete documents to be stored.
Each cylinder measured will display the value in brackets [ ] indicating the position has already been measured. Should you want to return to a particular cylinder, select cylinder number and press OK, the display will ask if you wish to re-measure the position, if yes, press OK, this will delete the previous data. New measurements can be taken as described in section MEASURING CRANKSHAFT DEFLECTION, page 6.

FIND STORED DOCUMENTS

To find stored documents you should follow the procedure below;

- Start the instrument by pressing OK, accept date/time with OK
- The display will ask NEW DOCUMENT?
- Pressing the right > arrow the display will move to FIND STORED DOCUMENT, press OK
- The display will now ask you to choose DOCUMENT NR.
- Using the right > arrow key, you move to the required document, then press OK.
- The display now shows READ DOC (see section READ DOCUMENTS, page 8), continue to use the left < arrow key, the next display will show EDIT DOC (see section EDIT DOCUMENTS, page 7), next, RETURN TO BASE, next FIND OTHER DOCUMENTS, and DELETE DOC (see section DELETE DOCUMENTS, page 8).

EDIT DOCUMENTS

This menu allows you to recover and view previous measurements, or continue to measure incomplete data. Follow section FIND STORED DOCUMENTS, page 7 above until EDIT DOC is displayed, press OK, then proceed as described in section MEASURING CRANKSHAFT DEFLECTION, page 6.

READ DOCUMENTS

This menu enables you to check previous measurement values.
Follow section FIND STORED DOCUMENTS, page 7 until READ DOC is displayed, press OK.
Select the cylinders you wish to check using < or > buttons
When all positions are checked the display will ask NEXT CYLINDER?
When all cylinders have been viewed the display will ask READ DOC DONE, press OK.
The display will now ask FIND OTHER DOCUMENTS.
Should you want to return to base, use right > arrow key for RETURN TO BASE, press OK.

DELETE DOCUMENTS

This menu provides two options; delete a single document or, delete all documents.
Delete single document:
Follow section FIND STORED DOCUMENTS, page 7 above until DELETE DOC is displayed, press OK.
The display will read ARE YOU SURE, NO ? If 'NO' press OK, the display will move to FIND OTHER DOCUMENTS. If arrow right > is pressed the display shows ARE YOU SURE, YES ? If 'YES', press OK.
Display will now show DOCUMENT DELETED and return to FIND STORED DOCUMENTS.
Delete all stored documents:
To delete all documents you should follow the procedure below;

- Start the instrument by pressing OK, accept date/time with OK.
- Pressing the right > arrow twice the display will move to DELETE ALL DOCUMENTS, press OK. The display will read ARE YOU SURE NO ?. If 'no' press OK, otherwise press right > arrow button to menu ARE YOU SURE, YES?, press OK to delete all documents.

The program will returns to menu NEW DOCUMENT status.
We recommend you consult the flow scheme in section FLOW CHART, pages 10 -11. This will greatly assist in understanding the sequence of events.

BATTERY CHARGE

When the power of the battery goes low, a battery indicator will indicate low battery level in the left side of the display. A built-in protection circuit will switch off the instrument automatically when the voltage reach 3,2V to protect the battery from being totally discharged. Charge the battery with the charger until the led indicator of the charger switches from red to green light. Make sure to use only the original charger supplied with the DI-5C.

DATA TRANSFER TO PC

All data stored in the Prisma DI-5C can be transfered to a PC. The software and USB cable included with the instrument has been developed to make the operation as simple as possible. It is also possible to connect the instrument directly to a PC while taking measurements from the engine. Pressing OK while measuring values A - E will automatically transfer the measuring data to the PC program.
NOTE Remember to save the measurement data as a file in your PC.
See the separate "Prisma DI-5C Software Manual".

CYLINDER LINER MEASUREMENT

The Prisma DI-5C also has a preprogrammed function for storing up to 45 cylinder liner measuring documents.
The accessory Prisma DI Ovality Kit, part no. 488-8100 is required for cylinder liner measurement. This measuring equipment can be used to accurately record ovality patterns of cylinders ranging between 180 mm to 600 mm bore. Larger liners may be measured with additional extension bars supplied by PrismaTibro.

SPARE PART LIST

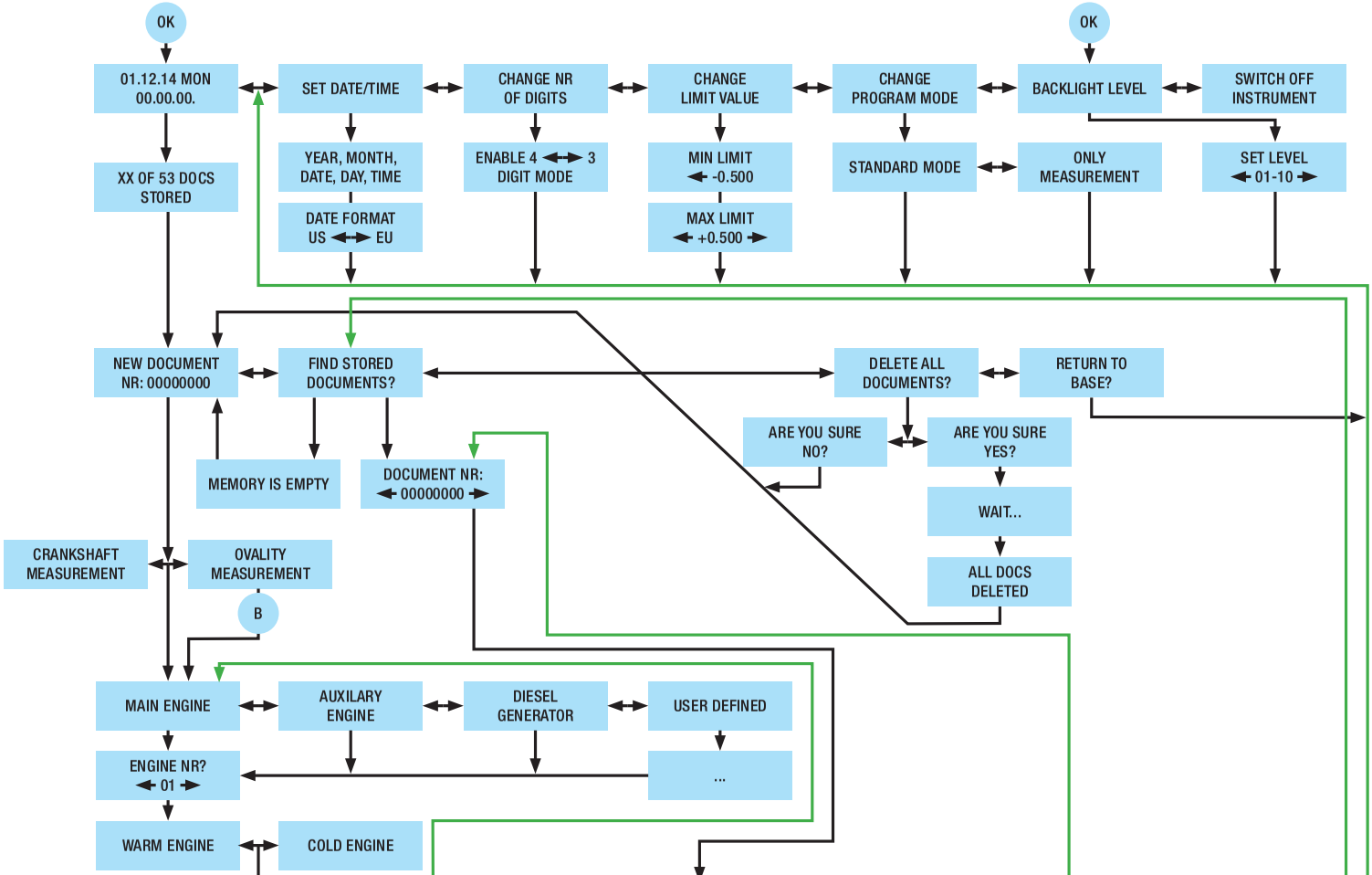
ITEM NO	DESCRIPTION
423-3637	Adjusting sleeve, small 10 mm
412-2643	Adjusting sleeve, Standard, 12 mm
401-1901	Battery Li-Ion with 3 wires connector
412-2893	Cable 7p/5p DIN, 3,6 meter
412-2897	Cable 7p/5p DIN, 7 meter
501-1992	Charger for Li-Ion battery
458-5000	Extension Bar Set: 2x160 mm, 1x80, 40, 20, 10 mm, 10 mm measuring tip
458-5107	Extension Bar, 10 mm
458-5160	Extension Bar, 160 mm
458-5205	Extension Bar, 20 mm
458-5402	Extension Bar, 40 mm
458-5809	Extension Bar, 80 mm
423-3641	Locking Ring, Small, 10 mm
412-2794	Locking Ring, Standard, 12 mm
412-2899	Magnet to be attached to cable
458-6123	Measuring Tip, 14 mm
458-6074	Measuring Tip, small, 7 mm
458-6106	Measuring Tip, Standard, 10 mm
12-2903-A	Prisma DI Plastic Case, Black 300x265x140 mm
458-6000	Spare Tips Set: Transducer Tip Standard & 17 mm, Measuring Tip Standard & 14 mm
423-3005	Transducer Small, min 60 mm, including measuring tip 7 mm **Note!** *This item should not be ordered as a spare if the same type was not supplied with the original kit from the factory*
412-2005	Transducer Standard, min 89 mm, including measuring tip 10 mm
423-3242	Transducer Tip small 7 mm
434-4758	Transducer Tip, 17 mm
412-2214	Transducer Tip, Standard
501-1900	USB Cable 2 meter

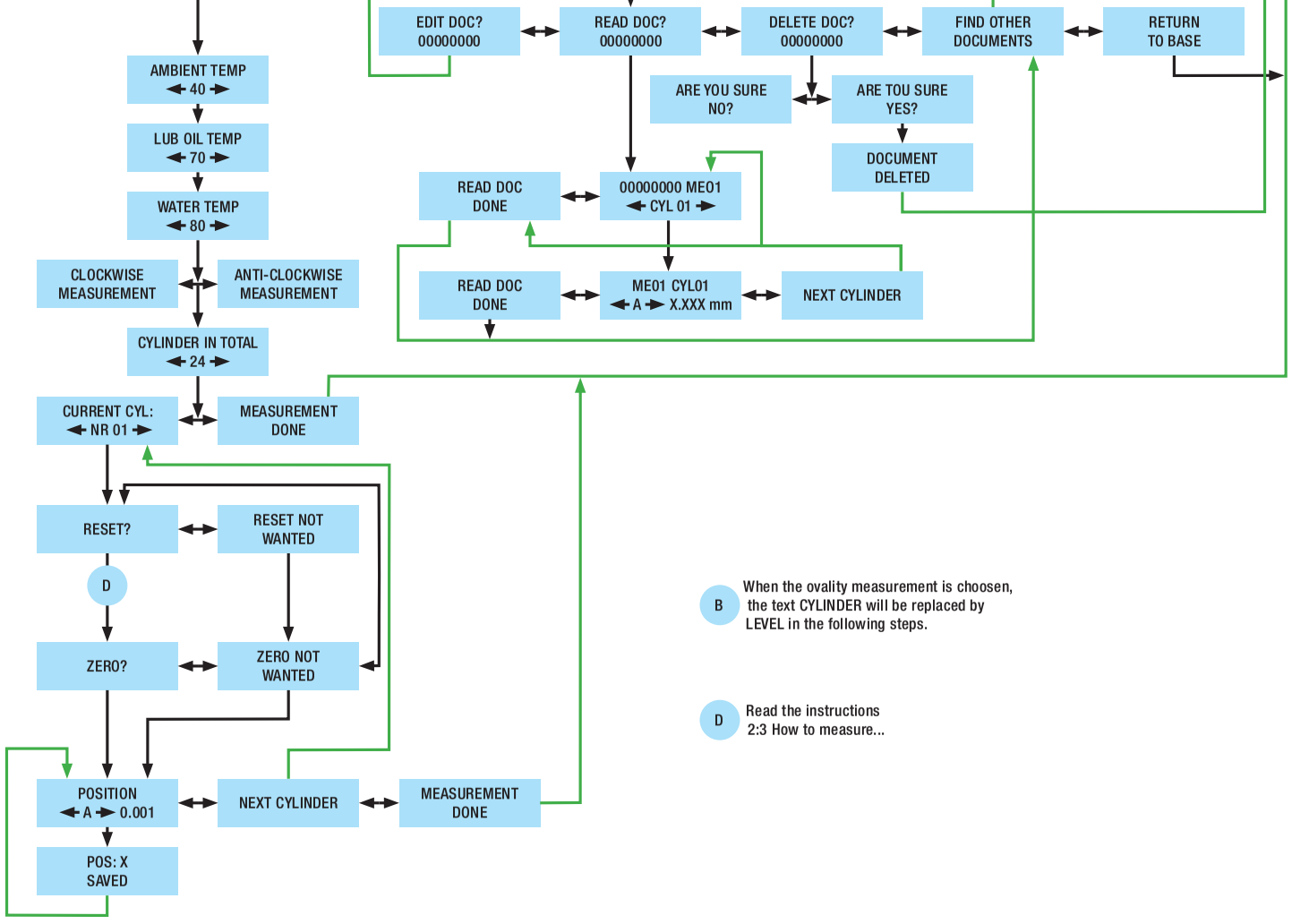
RECYCLING

Decommissioning and Recycling of Prisma DI-5C

- The metal parts to be recycled as metals
- The electronic parts to be recycled as electronics
- The plastic case/bag to be recycled as plastic
- The Lithium Ion battery to be recycled as Dangerous Goods

FLOW CHART


OK
01.12.14 MON
00.00.00.
SET DATE/TIME
CHANGE NR
OF DIGITS
CHANGE
LIMIT VALUE
CHANGE
PROGRAM MODE
OK
BACKLIGHT LEVEL
SWITCH OFF
INSTRUMENT
XX OF 53 DOCS
STORED
YEAR, MONTH,
DATE, DAY, TIME
DATE FORMAT
US ◄► EU
ENABLE 4 ◄► 3
DIGIT MODE
MIN LIMIT
◄ -0.500
MAX LIMIT
◄ +0.500 ►
STANDARD MODE
ONLY
MEASUREMENT
SET LEVEL
◄ 01-10 ►
NEW DOCUMENT
NR: 00000000
FIND STORED
DOCUMENTS?
DELETE ALL
DOCUMENTS?
RETURN TO
BASE?
ARE YOU SURE
NO?
ARE YOU SURE
YES?
WAIT...
ALL DOCS
DELETED
MEMORY IS EMPTY
DOCUMENT NR:
◄ 00000000 ►
CRANKSHAFT
MEASUREMENT
OVALITY
MEASUREMENT
B
MAIN ENGINE
AUXILARY
ENGINE
DIESEL
GENERATOR
USER DEFINED
ENGINE NR?
◄ 01 ►
...
WARM ENGINE
COLD ENGINE


EDIT DOC?
00000000
READ DOC?
00000000
DELETE DOC?
00000000
FIND OTHER
DOCUMENTS
RETURN
TO BASE
ARE YOU SURE
NO?
ARE TOU SURE
YES?
DOCUMENT
DELETED
AMBIENT TEMP
40
LUB OIL TEMP
70
WATER TEMP
80
READ DOC
DONE
00000000 ME01
CYL 01
CLOCKWISE
MEASUREMENT
ANTI-CLOCKWISE
MEASUREMENT
READ DOC
DONE
ME01 CYL01
A X.XXX mm
NEXT CYLINDER
CYLINDER IN TOTAL
24
CURRENT CYL:
NR 01
MEASUREMENT
DONE
RESET?
RESET NOT
WANTED
D
ZERO?
ZERO NOT
WANTED
POSITION
A 0.001
NEXT CYLINDER
MEASUREMENT
DONE
POS: X
SAVED
B
When the ovality measurement is choosen, the text CYLINDER will be replaced by LEVEL in the following steps.
D
Read the instructions
2:3 How to measure...

Prisma DI-5C

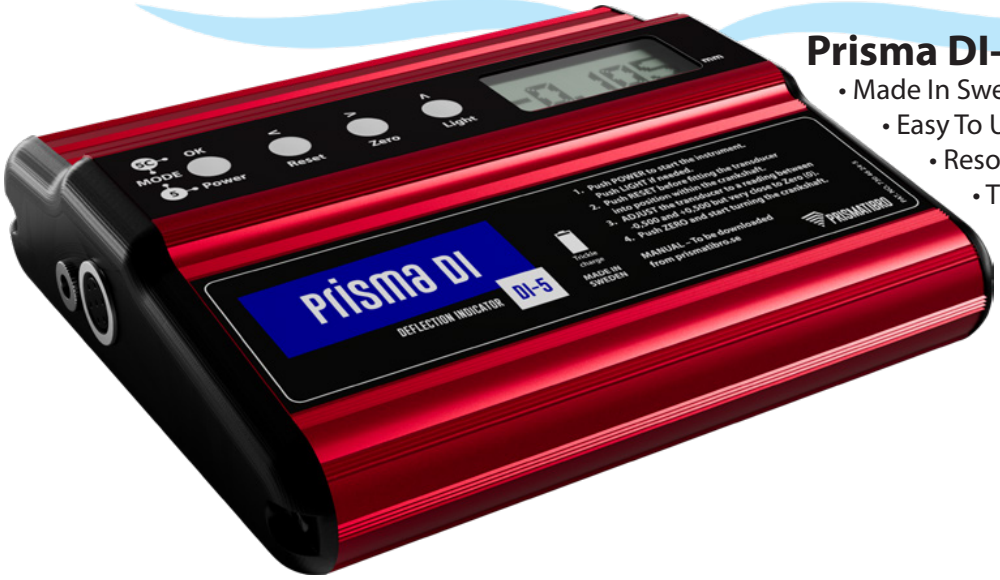
- Made In Sweden
- Easy To Use
- Resolution 1/1000 mm
- Trickle Charge
- Option: Ovality Kit
- **Transfer to Windows-PC**

Prisma DI Ovality Kit

ITEM NO 488-8100

Cylinder liner maintenance.
The Ovality Kit is an accessory to the Prisma DI-5C and Prisma DI-5. The method is simply giving 5 measuring points at each level of the liner. To compare the levels you will also see how much the wear of the liner is in the cylinder top.

Using the Prisma DI Ovality Kit together with Prisma DI-5C and kit you do have an outstanding funktion to load all your measurements into the PC software and print out graphs to see the wear and how it develops over time.



Prisma DI-5

- Made In Sweden
- Easy To Use
- Resolution 1/1000 mm
- Trickle Charge
- Option: Ovality Kit

PRISMATIBRO