



**CLEARLINE
AND
MULTI-CLEARLINE

USER'S MANUAL**

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INTRODUCTION

Clearline Air Gauges are compact, deadbeat reading instruments which operate on the back pressure principle, providing very high dimensional accuracy.

The 150-mm diameter dial is an exceptionally clear one, ideal in shop floor situations. Models are available calibrated in dual inch/ metric or metric only, and each gauge unit is equipped with a simple pressure check gauge fitted flush with the top of the case.

Two types of gauge unit are available within the range, the Clearline and Multi-Clearline. Both are basically similar in design the Multi-Clearline being a 3-channel version of the Clearline .

The handbook contains technical data, setting and operating instructions for both types.

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TECHNICAL DATA

DIMENSIONS/WEIGHT

		CLEARLINE	MULTICLEARLINE
Height	mm	280	280
Width	mm	200	250
Depth	mm	300	400
Weight	kg	6.7	9.4

AIR SUPPLY PRESSURE

413 - 827 kN/m²

60 - 120 psig

AIR REGULATED PRESSURE

All Models : 300 kN/m²

43 psig

AIR CONSUMPTION

Clearline

} 1.0 m³/Hr at 300 kN/m²

Multi -Clearline

FILTRATION

Norgren F73G followed by a Norgren F73C

Air hose connection to the filter is 1/4 G (BSP) parallel.

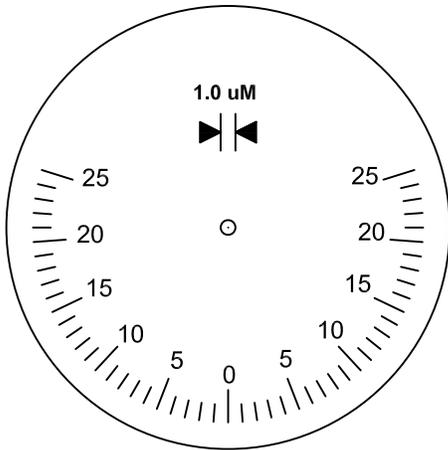


THE CLEARLINE AIR GAUGE UNIT

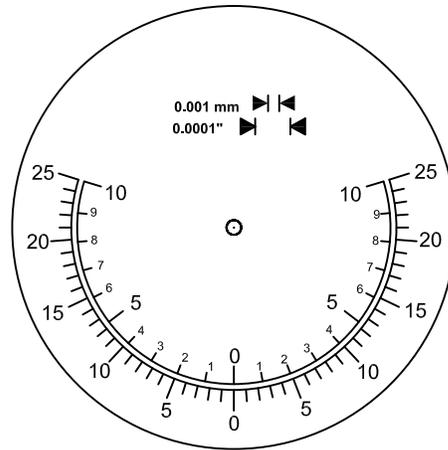


THE 3-WAY CLEARLINE UNIT

SCALES AND RANGES

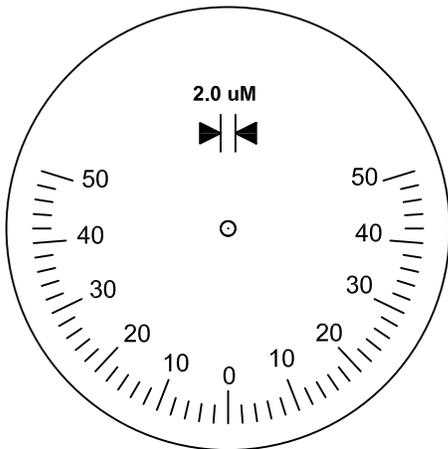


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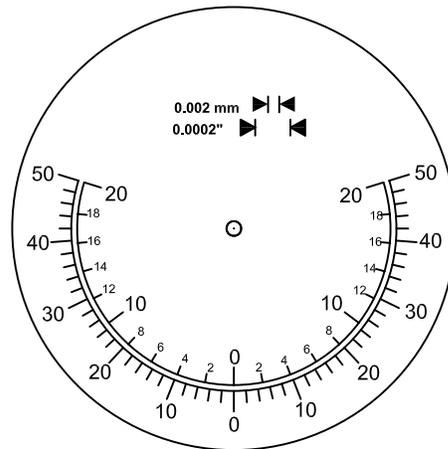


A100-62

Standard Dials



A100-24



A100-63

METRIC ONLY OR INCH/METRIC SCALES. Metric dials are coloured yellow. Dual scale dials are white with red markings for metric scales and black markings for inch scales.

Coloured tolerance pointers are red and green, and are adjustable to any position.

CONTROLS AND CONNECTORS

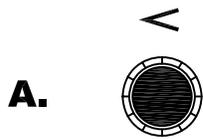
ZERO CONTROL



Manually operated control for the setting of correct centre zero.

On the Multi-Clearline these are independent of each other.

MAGNIFICATION CONTROL



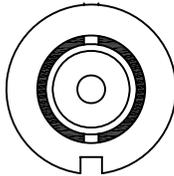
Manually operated control for the selection of the correct operating curve.

A. As on Clearline .



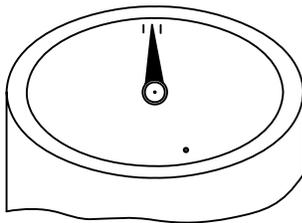
B. As on Multi-Clearline units. The suffix denotes which channel is in operation.

APG/ARG BAYONET CONNECTOR



Bayonet type connector for attaching air plug gauges and air ring gauges to the gauge unit.

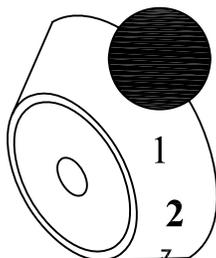
Common to all gauge units.



PRESSURE GAUGE CHECK

For monitoring the regulated air pressure to the gauge unit.

Common to all gauge units.

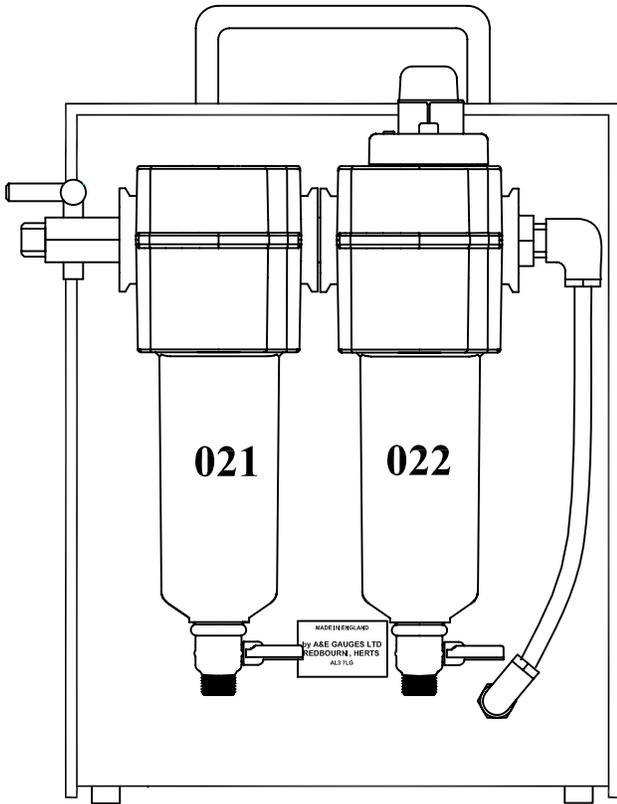


CHANNEL SELECTOR SWITCH

Multi-Clearline unit only.

Manually operated three position channel selector switch, marked 1,2,3.

REAR AND SIDE PANELS

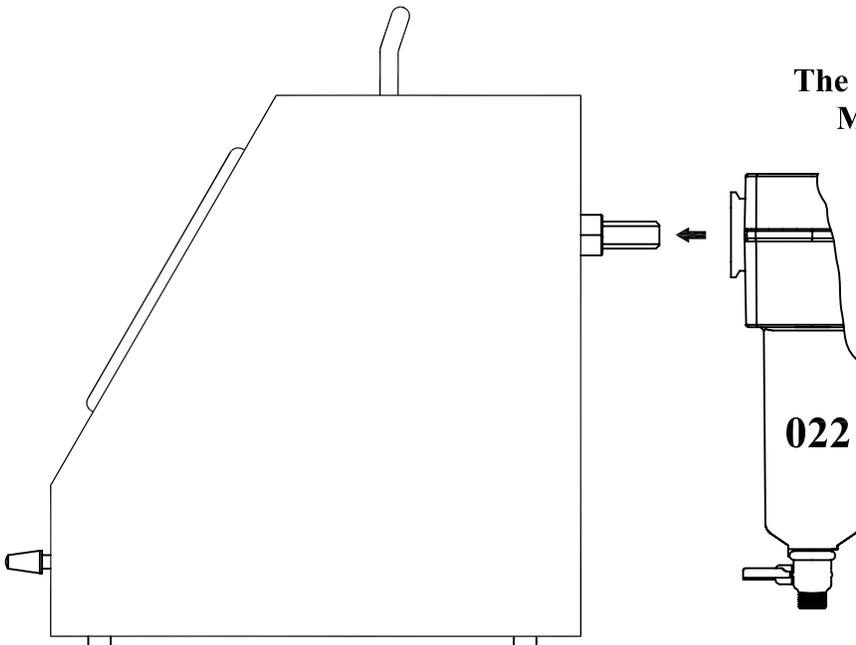


Rear view of Clearline showing the two filters.

**The pre-filter unit is the 021 whilst the main type is the 022.
See page 7 opposite...**

When the Multi-Clearline is delivered the filter unit is separate and must be screwed on shown in the illustration.

The 022 filter is next to the Multi-Clearline unit.



FILTRATION

WARNING

NEVER USE A PLASTIC BOWL FILTER WITH AIR SUPPLIED FROM A COMPRESSOR LUBRICATED WITH OIL CONTAINING PHOSPHATE ESTER AND/OR CHLORINATED HYDROCARBONS. USE A METAL BOWL TYPE IN THIS CASE!

The filtration system in all Clearline units is a double filter type employing Norgren filters.

A & E part numbers: 22045-021 (021) formerly F11
22045-022 (022) formerly F42

These filters are both of the manual drain variety and must have regular servicing intervals to ensure that the level of fluid in the bowl does not reach the main filter elements. An indicator is fitted to the 022 filter to show service requirement.

021 FILTER

The filter nearest to the air supply must be the type 021.

To drain the filter the plastic tap at the base of the bowl is opened. The air supply must remain *on* for efficient draining.

Once drained, the tap must be closed.

To clean the filter element, turn the bowl anti-clockwise and pull down to release. Unscrew the baffle and withdraw the element and filter shield from the filter guide. Wash in paraffin and blow out thoroughly with compressed air. The air supply must be *off* for disassembling.

TO CLEAN PLASTIC BOWLS, WASH IN SOAPY WATER ONLY. DO NOT USE A SOLVENT OF ANY TYPE, AS IT WILL DESTROY THE BOWL.

If the presence of solvents is suspected in the vicinity of the Clearline unit, then metal bowls are recommended.

022 FILTER

The filter nearest to the gauge unit must be the type 022.

To drain the filter the plastic tap at the base of the bowl is opened. The air supply must remain *on* for efficient draining.

To clean the filter element the air supply must be *off* turn the bowl anticlockwise and pull down to release and unscrew the main element by hand.

The main element may need replacing after two years service or the automatic indicator on top of the filter shows half red / half green. It is not designed to be cleaned.

TO CLEAN PLASTIC BOWLS, WASH IN SOAPY WATER ONLY. DO NOT USE A SOLVENT OF ANY TYPE, AS IT WILL DESTROY THE BOWL.

If the presence of solvents is suspected in the vicinity of the Clearline unit, then metal bowls are recommended.

IF DAMAGE TO THE BOWL IS FOUND OR SUSPECTED, THEN REPLACEMENT OF THE BOWL IS RECOMMENDED.

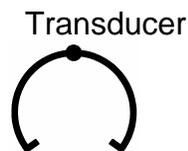
Maximum pressure for a transparent plastic bowl is:	10 bar	(150 psi)
Maximum temperature for a transparent plastic bowl is:	50°C	(120°F)
Maximum pressure for a metal bowl is:	16 bar	(250 psi)
Maximum temperature for a metal bowl is:	80°C	(175°F)
Minimum temperature for a manual drain filter is:	-6°C	(20°F)

SETTING INSTRUCTIONS

IMPORTANT

MEASURING HEAD IDENTIFICATION

Measuring heads must only be used with the system for which they have been Manufactured. All heads, ie plugs and rings, carry a symbol corresponding to the type of unit with which they must be used. These are shown below:-



The following pages give detailed setting instructions for the Clearline range of units.

Instructions are given for the setting of a Clearline unit. They are equally applicable for the Multi-Clearline unit. Each channel of the Multi-Clearline may be selected individually and set up according to the instructions given for the Clearline units.

When carrying out these setting instructions, it is not advisable to turn the magnification or zero controls hard up against their limit of travel, as damage will result.

Prior to setting, observe that the mains air pressure is adequate by checking the pressure check gauge. (see page 5).

It will also be necessary to ensure that the pressure is not affected by other equipment being fed from the same supply line.

NOTE:-

The following setting instructions are based on the assumption that a standard air gauge is being employed with a metric reading Clearline gauge unit, which has a scale range of $\pm 0.025\text{mm}$ and graduations in which each division is 0.001mm on a 25-0-25 scale.

With slight modifications, the procedure outlined here will also apply to other Clearline models and types of gauging head.

NO AIR

1. Observe Set + and Set – markings on the high and low limit setting rings.
2. Set RED tolerance pointer to Set + value and the GREEN tolerance pointer to the Set – Value.
3. Insert the APG into the bayonet socket on the gauge unit front panel.
4. Turn MAG control fully clockwise. Turn ZERO control to the fully clockwise position and then back one complete turn.

AIR

5. Open air supply stop valve. Check regulated pressure on the pressure check gauge located on the top panel. The pressure must be between the two red lines.
6. Apply the Set + ring to the APG
7. Turn the MAG control anti-clockwise until the needle and the tolerance pointer (RED) coincide.
8. Remove the Set + ring and replace with the Set – ring.
9. If the needle now coincides with the GREEN pointer, then the unit is correctly calibrated. If not, then proceed as follows.

ABOVE

10. Needle above the pointer:
11. Turn the MAG control anti-clockwise until the needle is TWICE the amount above.
12. Turn the ZERO control anti-clockwise until the needle and the GREEN pointer coincide.

BELOW

13. Needle below the pointer:
14. Turn the MAG control clockwise until the needle is TWICE the amount below the pointer as it was previously.

15. Turn the ZERO control clockwise until the needle and the GREEN pointer coincide.
16. Remove the Set – ring and replace with the Set + ring.
17. If the needle now coincides with the RED pointer, then the unit is correctly calibrated. If not then proceed as follows

ABOVE

18. Needle above the pointer.
19. Turn the MAG control anti-clockwise until the needle is as far below the RED pointer as it was previously above it.
20. Turn the ZERO control anti-clockwise until the needle and RED pointer coincide.

BELOW

21. Needle below the pointer.
22. Turn the MAG control clockwise until the needle is as far above the RED pointer as it was previously below it.
23. Turn the ZERO control clockwise until the needle and RED pointer Coincide.
24. Repeat operations 10 to 22 until the needle coincides with the GREEN pointer when the Set – ring is applied and with the RED pointer when the Set + ring is applied.

The unit will then be correctly calibrated and the RED and GREEN pointers can be set to their correct upper and lower tolerance values as specified by the application.

MULTI-CLEARLINE

To set up the Multi-Clearline gauge unit , select each channel in turn and set up as for Clearline setting procedure, using MAG and ZERO controls of the selected channels.

RANGING AND SETTING AIR PROBES

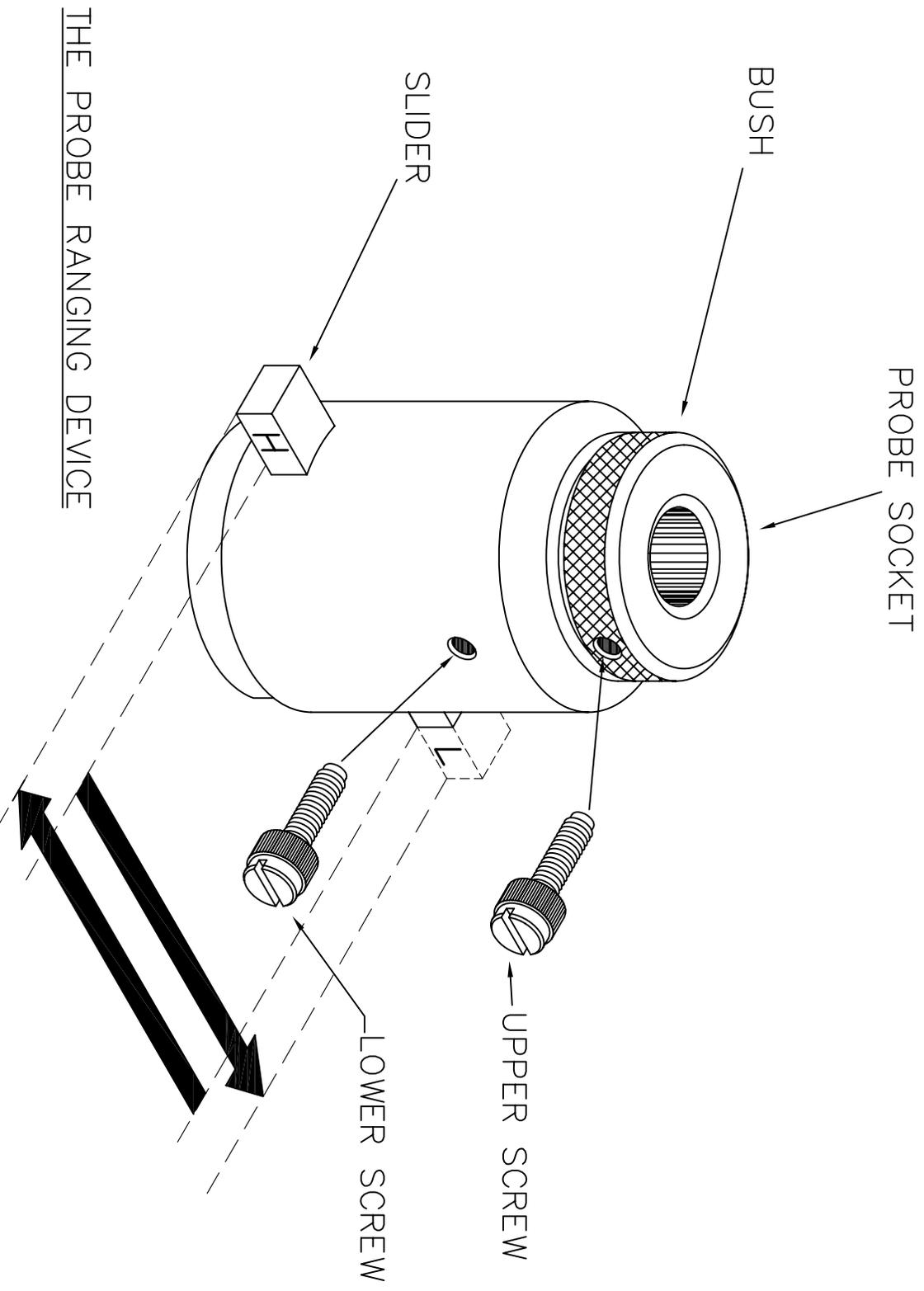
PROBE RANGING

To achieve the correct magnification, air probe must be ranged with the air gauge unit. This may be done:

- a. By moving the probe in a compactor stand and using gauge blocks (slip gauges) with a difference of size as shown in the table below.
- b. By using a probe ranging device.

THE PROBE RANGING DEVICE

The ranging device, illustrated below, provides the means for mounting a probe in contact with a “slider” with a step equal to the recommended gauge interval.



RANGING DEVICE OR GAUGE BLOCK STEPS

GAUGE UNIT	SCALE		STEP		Order Ref	
	mm	in	mm	in		
Clearline	±0,025	±0.001	0,040	0.0016		95050.032
Clearline	±0,050			0,080	0.003	95050.034

The calibration step on each model of the ranging device is equal to 80% of the full scale of the air gauge unit with which it is to be used.

The L and H position of the slider must therefore be set at 40 % of full scale:

METRIC READING		INCH READING	
FULL SCALE	SET POINTS	FULL SCALE	SET POINTS
±0,025	±0,020	±0.001	±0.0008
±0,050	±0,040	±0.002	±0.0016
±0,100	±0,080	±0.004	±0.0032

SETTING MASTERS

If the probe is to be used in direct contact with the component, a single calibrated setting master is sufficient, but if used in a fixture incorporating any form of lever to transmit the reading to the probe, two masters are advisable to eliminate the possibility of errors of magnification

AIR PROBE SETTING INSTRUCTIONS

1. Turn the gauge control marked (**0**) fully clockwise, then anti-clockwise by one turn.

Turn the gauge control marked < fully clockwise, then anti-clockwise by two turns.

2. Connect the air probe hose to the adapter socket on the front panel of the gauge unit and turn on the air supply.
3. Push in the slider on the ranging device to display the L marking and insert the probe into the socket until air just begins to escape from the top end of the probe. Firmly tighten the upper nylon screw to lock the probe in this position.
4. Slowly rotate the bush to give the required L reading on the scale of the gauging unit. Tighten the lower nylon screw to lock the bush in this position, ensuring that the reading on the gauge remains unchanged.

5. Push in the slider to display the H markings.
6. If the gauge now shows the required H reading, the calibration is correct. If not, further adjustments are necessary as follows:
7. With the slider still set to the H marking, observe whether the gauge unit reads above or below the required reading.
 - 7a If **above**, turn the < control anti-clockwise until the needle is positioned as far below the required reading as it was previously above it.

Set the needle to the required reading using the ranging device bush.
Screw in or out
 - 7b If **below**, turn the < control clockwise until the needle is positioned as far above the required reading as it was previously below it.

Set the needle to the required reading using the ranging device bush.
Screw in or out.
8. Push in the slider to display the L marking. Observe whether the gauge unit reads above or below the required reading.
 - 8a If **above**, turn the < control anti-clockwise until the needle is positioned twice the amount above the required reading as it was previously.

Set the needle to the required reading using the ranging device bush.
Screw in or out
 - 8b If **below**, turn the < control clockwise until the needle is positioned **twice** the amount the required reading as it was previously.

Set the needle to the required reading using the ranging device bush.
Screw in or out
9. Repeat operations 8 and 9 consecutively until the L and H readings are obtained for L and H settings of the slider on the ranging device.

The gauge unit is then correctly calibrated.

SERVICE

Your gauging and inspection procedures are a critical part of your production process, and their integrity is vital to your business.

Regular maintenance and calibration of this air gauge will ensure continuity of its usefulness, assure accuracy of measurement and prolong its service life. Time and production losses through unplanned repairs will be minimised.

Current BS/ISO approval requires regular maintenance and traceable calibration of all gauges and test equipment used in a manufacturing process.

A & E Gauges Ltd offers comprehensive service and calibration facilities for all its products. In line with current British Standard and ISO requirements we recommend that any gauge is serviced at least once a year. Some quality procedures require more frequent equipment servicing and re-calibration.

A & E Gauges gauging references are fully traceable to National Standards. Conformity and calibration certificates are available if required.

Full service support is provided for all air gauging products, and on-site service contracts for larger users are strongly recommended. The Service Department will be pleased to provide full details of service rates and contract terms.

Contact : The Service Department

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