

Refacing Valve Face



Refacing Valve Seat



Face Turning Sealing Surface



Counterboring Seat Ring Pocket

## APPLICATION

The HUNGER UDM4E is a versatile machine offering a choice of modular components for

- refacing valves,
- refacing valve seats,
- counterboring seat ring pockets and
- resurfacing the sealing surfaces on cylinder heads, cylinder liners and engine blocks of large diesel and gas engines.

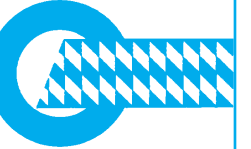
## KEY FEATURES

- No abrasive dust. A fast clean cut.
- Compact and handy design.
- Modular add-on components provide a flexible solution for multiple projects.
- Powered by SELV (Safety Extra Low Voltage) to avoid risk of electrical shock.
- Power supply with universal AC input.
- Fast set-up time.
- Easy to use
- The economical solution for both field and workshop use.

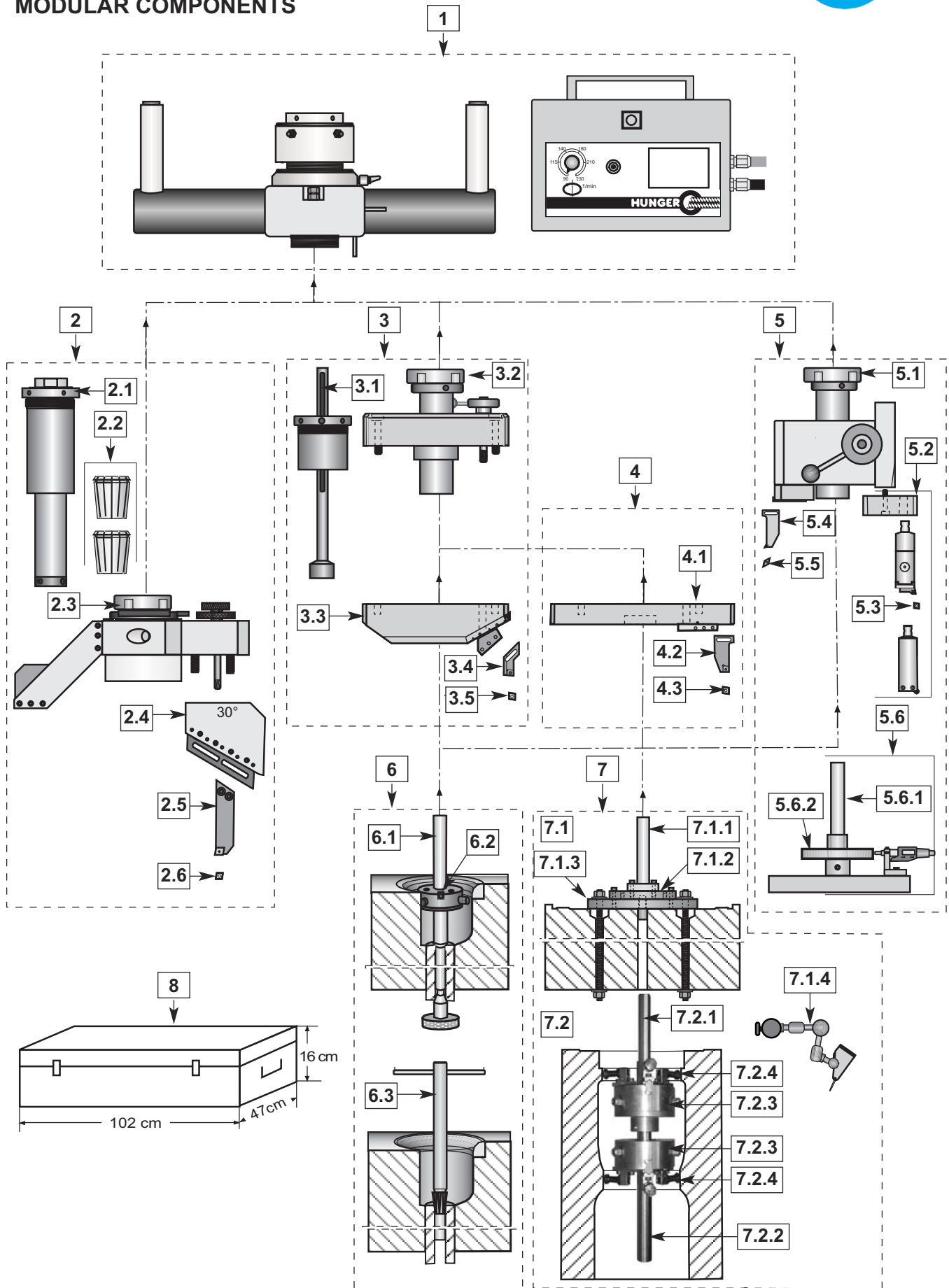
## SPECIFICATIONS

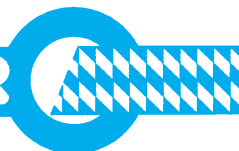
|                                      |                |
|--------------------------------------|----------------|
| Valve Refacing Capacity              |                |
| Valve stem diameter range            | 16 - 37 mm     |
| Valve face diameter range            | 60 - 230 mm    |
| Valve angle range                    | 45° - 20°      |
| Valve Length                         | >400 mm        |
| Valve seat refacing capacity:        |                |
| Valve seat diameter range            | 60 - 230 mm    |
| Valve seat angle range               | 45°-19,5°      |
| Face Turning Diameter Range          | 70 - 500 mm    |
| Counterboring Diameter Range         | 66 - 225 mm    |
| Rotational Speed Range               | 100 - 230 rpm  |
| Electrics                            |                |
| Universal Input Voltage Range        | 100 - 300 VAC  |
| Power Requirement                    | 0,5 kW         |
| Operating Voltage of Drive Unit      | max. 58 VDC    |
| Dimensions                           |                |
| Motor Drive Unit                     |                |
| Length/Width/Height                  | 485/175/210 mm |
| Universal Power Supply Unit          |                |
| Length/Width/Height                  | 380/180/210 mm |
| Net Weights                          |                |
| Machine Drive Unit                   | 7,5 kg         |
| Collet Chuck for clamping the valves | 2,6 kg         |
| Valve Refacing Gear Unit             | 6,3 kg         |
| Valve Refacing Head                  | 1,6 kg         |
| Universal Power Supply Unit          | 7,7 kg         |
| Seat Refacing Gear Unit              | 6,5 kg         |
| Seat Refacing Head                   | 5,1 kg         |

Alterations subject to change without prior notice



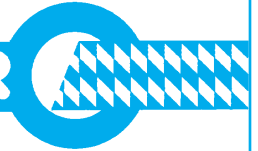
MODULAR COMPONENTS





## MODULAR COMPONENTS

| Item  | Description   | P/N        | Item  | Description  | P/N           |
|-------|---|------------|-------|--|---------------|
| 1.    | <b>UDM4E Motor Drive Unit</b><br>including Universal Power Supply Unit<br>wired for input voltage range 100 - 300 VAC | 280 01 001 | 4.2   | Insert Holder for Face Turning   |               |
| 2.    | <b>Accessories for Refacing Valves</b>  |            | 4.2.1 | <b>HC02.1 Insert Holder</b>  | 247 65 121    |
| 2.1   | <b>Collet Chuck</b>   | 280 31 000 | 4.3   | Cutting Insert for Face Turning  |               |
| 2.2   | Collets for Chucking the Valves   |            | 4.3.1 | <b>Insert Type C0904CB</b>   | 862 20 010    |
| 2.2.1 | <b>V18 Collet Set</b> for valve stem diam. 18-16 mm   | 279 50 018 | 5.    | <b>Accessories for Counterboring</b>   |               |
| 2.2.1 | <b>V20 Collet Set</b> for valve stem diam. 20-18 mm   | 279 50 020 | 5.1   | Boring Heads   |               |
| 2.2.2 | <b>V22 Collet Set</b> for valve stem diam. 22-20 mm   | 279 50 022 | 5.1.1 | <b>AV Boring Head</b><br>including vertical tool slide   | 259 10 500    |
| 2.2.3 | <b>V24 Collet Set</b> for valve stem diam. 24-22 mm   | 279 50 024 | 5.1.2 | <b>AVH Boring &amp; Facing Head</b><br>including vertical and horizontal tool slide                                    | 259 10 570    |
| 2.2.4 | <b>V26 Collet Set</b> for valve stem diam. 26-24 mm   | 279 50 026 | 5.2   | Tooling for counterboring<br>Type Diameter Range   |               |
| 2.2.5 | <b>V28 Collet Set</b> for valve stem diam. 28-26 mm   | 279 50 028 | 5.2.1 | <b>Boring Tool Base Type B1</b> 90-225 mm  | 259 12 060    |
| 2.2.6 | <b>V30 Collet Set</b> for valve stem diam. 30-28 mm   | 279 50 030 | 5.2.2 | <b>Precision Boring Tool Type B1</b> 90-225 mm   | 259 20 120    |
| 2.2.7 | <b>V32 Collet Set</b> for valve stem diam. 32-30 mm   | 279 50 032 | 5.2.3 | <b>Form Boring Tool Type B1</b> 90-225 mm  | 259 20 150    |
| 2.2.8 | <b>V34 Collet Set</b> for valve stem diam. 34-32 mm   | 279 50 034 | 5.2.4 | <b>Boring Tool Base Type D1</b> 72-100 mm  | 259 14 060    |
| 2.2.9 | <b>V36 Collet Set</b> for valve stem diam. 36-34 mm   | 279 50 036 | 5.2.5 | <b>Precision Boring Tool Type D1</b> 72-100 mm   | 259 14 110    |
| 2.3.  | <b>VG4 Valve Refacing Gear Unit</b>   | 280 11 000 | 5.2.6 | <b>Form Boring Tool Type D1</b> 72-100 mm  | 259 20 821    |
| 2.4   | Valve Refacing Heads  |            | 5.3   | Insert for Precision Boring Tools B1 an D1   |               |
| 2.4.1 | <b>V4/45° Valve Refacing Head</b> for 45° valves  | 280 25 000 | 5.3.1 | <b>Insert Type C0604HC</b>   | 862 20 050    |
| 2.4.2 | <b>V4/40° Valve Refacing Head</b> for 40° valves  | 280 24 000 | 5.4   | Tooling for Facing Bottom of Counterbore   |               |
| 2.4.3 | <b>V4/30° Valve Refacing Head</b> for 30° valves  | 280 23 000 | 5.4.1 | <b>H01 Insert holder</b> for diam. 60-160 mm   | 259 65 110    |
| 2.4.4 | <b>V4/20° Valve Refacing Head</b> for 20° valves  | 280 22 000 | 5.4.2 | <b>H02 Insert holder</b> for diam. 100-220 mm  | 259 65 120    |
| 2.5   | Insert Holder for Valve Refacing  |            | 5.5   | Insert for Facing Bottom of Counterbore  |               |
| 2.5.1 | <b>VR01 Insert Holder</b> short version   | 280 65 103 | 5.5.1 | <b>Insert Type W1104CU</b> for H01/02 Holder   | 862 20 050    |
| 2.5.2 | <b>VR02 Insert Holder</b> long version  | 280 65 104 | 5.6   | Optional Accessories for Setting Boring Diam.  |               |
| 2.6   | Cutting Inserts   |            | 5.6.1 | <b>Boring Tool Setting Stand</b><br>Includes digital micrometer screw for precise<br>setting of the boring diameter    | 259 50 100    |
| 2.6.1 | <b>Insert Type C0904CB</b> (General purpose)  | 862 20 010 | 5.6.2 | <b>Reference Disks</b><br>for setting micrometer screw to a reference<br>diamter near to the desired oversize diameter | 259 50 xxx    |
| 2.6.2 | <b>Insert Type C0904HB</b> (Cr & Ni alloys)   | 862 20 013 | 6.    | <b>Alignment for Seat Refacing &amp; Counterboring</b>   |               |
| 2.6.3 | <b>Insert Type C0904HU</b> (Hard materials)   | 862 20 015 | 6.1.1 | <b>Customized Pilots</b><br>tailored to particelat engine model  | on<br>request |
| 2.6.4 | <b>Insert Type C0904CBN</b> (Very hard materials)   | 862 20 022 | 5.1.2 | <b>UP4.1 Universal Pilot Kit</b><br>for valve guide bore range 16-27mm   | 249 70 410    |
| 3.    | <b>Accessories for Refacing Valve Seats</b>   |            | 5.1.3 | <b>UP4.1 Universal Pilot Kit</b><br>for valve guide bore range 16-27mm   | 249 70 410    |
| 3.1   | <b>Depth Stop Assembly</b>  | 280 32 000 | 5.2   | <b>Supporting Spiders</b><br>for supporting pilot shaft just below the seat  | on<br>request |
| 3.2   | <b>VD4 Seat Refacing Gear Unit</b>  | 249 10 310 | 5.3   | <b>Chamfering Tools</b><br>for cleaning the valve guide  | on<br>request |
| 3.3   | Valve Seat Refacing Heads   |            | 7.    | <b>Alignment for Face Turning</b>  |               |
| 3.3.1 | <b>D4/45° Seat Refacing Head</b> for 45° seats  | 249 11 345 | 7.1   | Alignment for resurfacing cylinder head  |               |
| 3.3.2 | <b>D4/40° Seat Refacing Head</b> for 40° seats  | 249 11 340 | 7.1.1 | <b>Guiding Arbor</b>   | 249 71 005    |
| 3.3.3 | <b>D4/30° Seat Refacing Head</b> for 30° seats  | 249 12 330 | 7.1.2 | <b>Aligning Disk</b>   | 258 79 700    |
| 3.3.4 | <b>D4/20° Seat Refacing Head</b> for 20° seats  | 249 17 320 | 7.1.3 | <b>Mounting Assembly</b><br>tailored to the respective engine model  | on<br>request |
| 3.3.5 | <b>D4/19,5° Seat Refacing Head</b> for 19,5° seats  | 249 18 319 | 7.1.4 | <b>Aligning Gauge</b>  | 258 93 350    |
| 3.4   | Insert Holders for Refacing Valve Seats   |            | 7.2   | Alingment for resurfacing engine blocks  |               |
| 3.4.1 | <b>SD00 Insert Holder</b> for seat diam. 60-100 mm  | 247 65 108 | 7.2.1 | <b>Guiding Arbor</b> (Same as 7.1.1)   | 249 71 005    |
| 3.4.2 | <b>SC01 Insert Holder</b> for seat diam. 90-140 mm  | 247 65 103 | 7.2.2 | <b>Pilot Spindle</b>   | 258 71 010    |
| 3.4.3 | <b>SC02 Insert Holder</b> for seat diam. 130-250 mm   | 247 65 104 | 7.2.3 | <b>Set (2 pcs) of Centering Chucks</b>   | 258 71 200    |
| 3.5   | Cutting Inserts for Refacing Valve Seats<br>Type Suitable Application<br>for Holder                                   |            | 7.2.4 | <b>Sets (6pcs) of Top Jaws</b> for ID 190-300 mm   | 258 71 220    |
| 3.5.1 | <b>Insert C0604CB</b> SD00 General purpose  | 862 20 021 | 7.2.5 | <b>Sets (6pcs) of Top Jaws</b> for ID 290-430 mm   | 258 71 240    |
| 3.5.2 | <b>Insert C0602HB</b> SD00 Very hard seats  | 862 20 016 | 8.    | <b>Storage of Machine and Accessores</b>   |               |
| 3.5.3 | <b>Insert C0908CU</b> SC01/02 General purpose   | 862 20 007 | 8.1   | <b>Storage Box</b>   | 280 90 000    |
| 3.5.4 | <b>Insert C0908HU</b> SC01/02 Super alloys  | 862 20 009 |       |  |               |
| 3.5.5 | <b>Insert C0904CB</b> SC01/02 Hard seats  | 862 20 010 |       |  |               |
| 3.5.6 | <b>Insert C0904HB</b> SC01/02 Cr & Ni alloys  | 862 20 013 |       |  |               |
| 3.5.7 | <b>Insert C0904HU</b> SC01/02 Very hard seats   | 862 20 015 |       |  |               |
| 3.5.8 | <b>Insert C0904CBN</b> SC01/02 Extremely hard seats   | 862 20 022 |       |  |               |
| 4.    | <b>Accessories for Face Turning</b>   |            |       |  |               |
| 4.1   | Facing Heads<br>Type Diameter Range   |            |       |  |               |
| 4.1.1 | <b>D4.1/0° Facing Head</b> 70 - 330 mm  | 249 20 200 |       |  |               |
| 4.1.2 | <b>D4.2/0° Facing Head</b> 75 - 370 mm  | 249 20 300 |       |  |               |
| 4.1.3 | <b>D4.6/0° Facing Head</b> 95 - 500 mm  | 249 20 450 |       |  |               |



## WORKING PRINCIPLE

The seating face is refaced to the preset depth by the simultaneous application of both a rotary and a transverse feed motion to the cutting tool fitted with an indexable cutting insert.

While the cutting tool rotates in a circle around the valve face, valve seat or sealing surface, a feed gear mechanism ensures a continuous outward transverse feed motion under the appropriate angle.

This angle is defined by an slideway provided for the tool slide in the exchangeable refacing head.

The lathe-type refacing action provides a flawless concentric surface texture for a perfect seal.

Roundness, concentricity and surface finish of the refaced faces are within manufacturers' specifications or even better.

## DRIVE UNIT

The UDM4E drive unit is fitted with two motors providing a smooth cutting action.

The operating voltage supplied to the motors by a compact universal power supply unit is of the low voltage type to eliminate electric hazards.

The speed of the motors is infinitely variable so that the cutting speed can be adapted to the diameter and material to be refaced.

The universal power supply unit is wired for connection to AC line voltages within a broad range of from 100 V to 300 V.

## REFACING VALVES

For valve seat refacing, the VG4 valve refacing gear unit is screwed to the drive unit by means of a union nut.

The proper valve refacing head is attached to the feed gear unit by two bolts and, therefore, can be easily mounted and removed.

The valve refacing heads with the built-in slideway for cutting tool travel eliminate faulty angle setting operations and ensure the same precise seat angle time and again.

The stem of the valve is placed into a collet chuck which is inserted into the drive unit and which includes two collets arranged in tandem for precise alignment of the valves.

## REFACING VALVE SEATS

For refacing valve seats, the VD4 seat refacing gear unit is screwed to the drive unit by means of a union nut and the appropriate seat refacing head is bolted to the VD4E seat refacing gear unit.

The VD4 seat refacing gear unit and the seat refacing heads supplied with our VD4E valve seat refacing machine can be also used for the UDM4E.

The UDM4E fitted with a valve refacing gear unit and the appropriate seat refacing head is aligned in centerline with the valve guide by a pilot which is inserted into the valve guide and stabilized by a supporting spider just below the valve seat.

## RESURFACING SEALING SURFACES

A series of face turning heads is available for resurfacing sealing surfaces on cylinder heads and engine blocks.

For resurfacing the sealing surface, the face turning head is screwed to the VD4 seat refacing gear unit mounted to drive unit.

Pilot assemblies are available for aligning the UDM4E fitted with a face turning head square to the sealing surface.

## COUNTERBORING

For counterboring seat ring pockets for oversize seat ring installation, a boring head is screwed to the UDM4E drive unit.

Two types of boring heads are available. The standard boring head is provided with a vertical slide for counterboring the seat ring pockets.

The boring and facing head is provided with both a vertical slide for counterboring the seat ring pockets and a horizontal slide for facing the bottom of the seat ring pockets,

The precision boring tools are equipped with a vernier dial for adjusting the boring diameter in increments of 2µm to ensure high precision machining to IT6 tolerances.

Form boring tools are available for machining shoulders within the counterbores under special angles to facilitate O-ring installation.

The pilots and supporting spiders designed for seat refacing can be also used for aligning the UDM4E fitted with a boring head.

## Ludwig Hunger Werkzeug- und Maschinenfabrik GmbH

Mailing Address:  
PO Box 70 09 60  
81 Muenchen  
Germany

Office Address:  
Gräfelinger Str. 146  
81375 Muenchen  
Germany

Contact and Information  
Tel.: +49 89 7091 0  
sales@ludwig-hunger.de  
www.ludwig-hunger.de