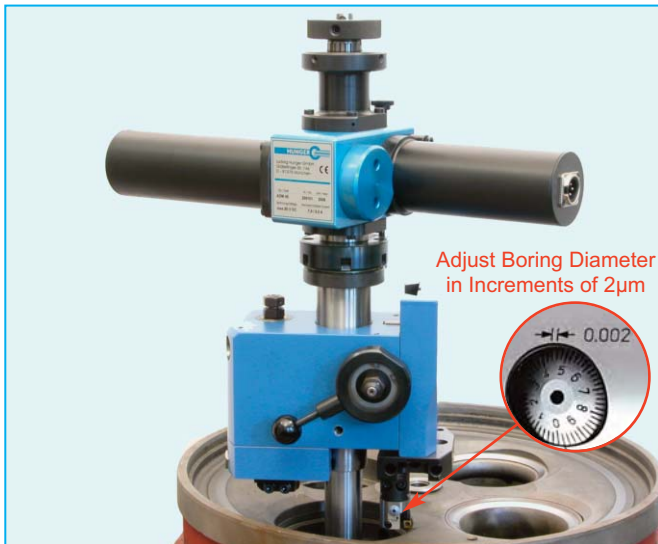


Refacing Valve Seat



Counterboring Seat Ring Pocket



Face Turning Sealing Surface

APPLICATION

The HUNGER VD4HD is a versatile machine offering a choice of modular components for

- 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.

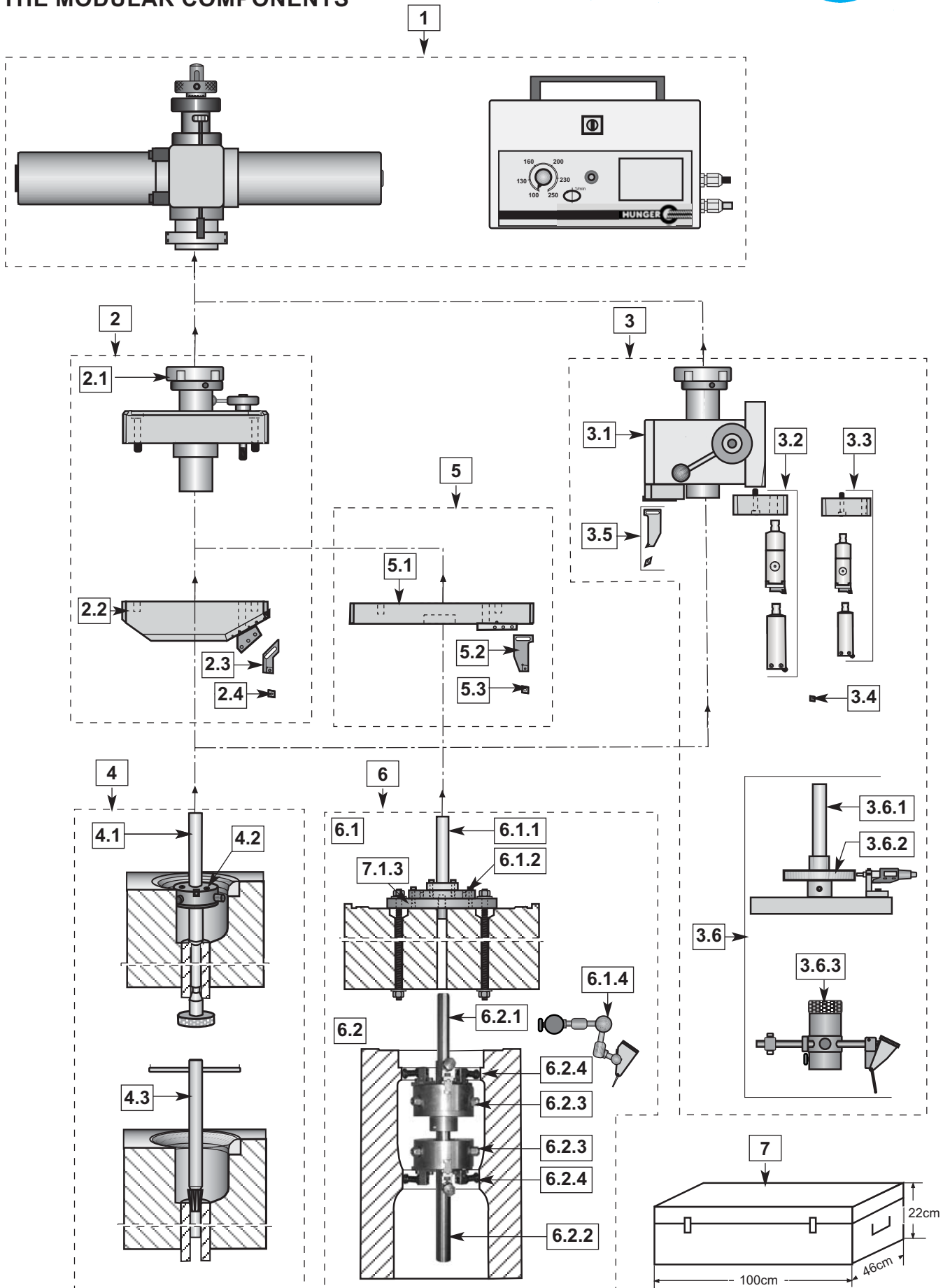
KEY FEATURES

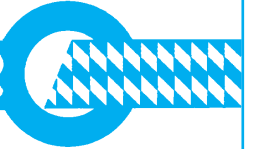
- No abrasive dust. A fast clean cut.
- Compact and handy design.
- Modular add-on components provide a flexible solution for multiple projects.
- Powered by SELV (Safety Extra Low Voltage) to avoid risk of electrical hazard.
- Universal power supply with wide input voltage range.
- Fast set-up time.
- Easy to use
- The economical solution for both field and workshop use.
- Successfully tested and approved by leading engine manufacturers.

SPECIFICATIONS

Valve Seat Refacing Capacities	
Valve seat diameter range	60 - 230 mm
Valve seat angle range	19,5° - 45°
Counterboring Diameter Range	66 - 225 mm
Face Turning Diameter Range	70 - 500 mm
Rotational Speed Range	100 - 250 rpm
Feed per revolution	0,05 mm
Electrics	
Universal Input Voltage Range	100 - 300 VAC
	1 Ph 50/60 Hz
Power Requirement	0,5 kW
Operating Voltage of Drive Unit	max. 50 VDC
Dimensions	
Motor Drive Unit	
Length	485 mm
Width	175 mm
Height	210 mm
Universal Power Supply Unit	
Length	380 mm
Width	180 mm
Height	210 mm
Net Weights	
Machine Drive Unit	7,5 kg
Valve Seat Refacing Gear Unit	6,5 kg
Valve Seat Refacing Head	5,1 kg
Counterboring and Facing Head	13,6 kg
Face Turning Head	7,1 kg
Universal Power Supply Unit	7,7 kg

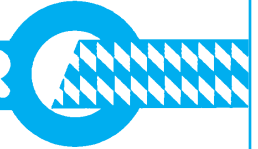
THE MODULAR COMPONENTS





THE MODULAR COMPONENTS

Item	Description	Part Number	Item	Description	Part Number
1.	VD4HD Motor Drive Unit including Universal Power Supply Unit wired for input voltage range 100 - 300 VAC	249 05 350	3.5	Tooling for Facing Bottom of Counterbore	
2.	Accessories for Refacing Valve Seats		3.5.1	H01 Insert holder for diameter range 60-160 mm	259 65 110
2.1	VD4 Seat Refacing Gear	249 10 310	3.5.2	H02 Insert holder for diameter range 100-220 mm	259 65 120
2.2	D4 Valve Seat Refacing Heads		3.5.3	Cutting Insert Type D1104CU for H01/02 Holder	862 20 030
2.2.1	D4/45° Seat Refacing Head for 45° seats	249 11 345	3.6	Optional Accessories for ease of operation	
2.2.2	D4/40° Seat Refacing Head for 40° seats	249 11 340	3.6.1	Boring Tool Setting Stand Includes digital micrometer screw for precise setting of the boring diameter	259 50 100
2.2.3	D4/30° Seat Refacing Head for 30° seats	249 12 330	3.6.2	Reference Disk for setting micrometer screw to a reference diameter near to the desired oversize diameter	259 50 xxx
2.2.4	D4/20° Seat Refacing Head for 20° seats	249 17 320	3.6.3	DP4 Bore Gauge for checking diameter of seat ring pocket	249 93 701
2.2.5	D4/19,5° Seat Refacing Head for 19,5° seats	249 18 319	4.	Alignment Accessories for Refacing & Boring	
2.3	Insert Holders for Refacing Valve Seats		41	Pilots for insertion into the valve guides	
2.3.1	SD00 Insert Holder for seat diam. 60-100 mm	247 65 108	4.1.1	Customized Pilots each tailored to a particular engine model	on request
2.3.2	SC01 Insert Holder for seat diam. 90-140 mm	247 65 103	4.1.2	UP4.1 Universal Pilot Kit for valve guide bore range 16-27mm	249 70 410
2.3.3	SC02 Insert Holder for seat diam. 130-230 mm	247 65 104	4.1.3	UP4.2 Universal Pilot Kit for valve guide bore range 27-40mm	249 70 420
2.4	Inserts for Refacing Valve Seats		4.2	Supporting Spiders for supporting pilot shaft just below the seat	on request
2.4.1	Insert Type C0604CB for SD00 Holder Application: General purpose	862 20 021	4.3	Chamfering Tools for cleaning the valve guide	on request
2.4.2	Insert Type C0602HB for SD00 Holder Application: Very hard seats	862 20 016	5.	RC Accessories for Face Turning	
2.4.3	Insert Type C0908CU for SC01/02 Holder Application: General purpose	862 20 007	5.1	Face Turning Heads	
2.4.4	Insert Type C0908HU for SC01/02 Holder Application: Super alloys	862 20 009	5.1.1	D4.1/0° Face Turning Head for facing diameter range 70 - 330 mm	249 20 200
2.4.5	Insert Type C0904CB for SC01/02 Holder Application: Hard seats	862 20 010	5.1.2	D4.2/0° Face Turning Head for facing diameter range 75 - 370 mm	249 20 300
2.4.6	Insert Type C0904HB for SC01/02 Holder Application: Cr & Ni alloys	862 20 013	5.1.3	D4.5/0° Face Turning Head for facing diameter range 95 - 500 mm	249 20 450
2.4.7	Insert Type C0904HU for SC01/02 Holder Application: Very hard seats	862 20 015	5.2	Insert Holder for Face Turning	
2.4.8	Insert Type C0904CBN for SC01/02 Holder Application: Extremely hard seats	862 20 022	5.2.1	HC02.1 Insert Holder L=75mm for refacing sealing surface on engine block	247 65 121
3.	ADM Accessories for Counterboring		5.2.2	HC02.2 Insert Holder L=100mm for refacing sealing surface on cylinder head	247 65 126
3.1	Boring Heads		5.3	Insert for Face Turning	
3.1.1	AV Boring Head including vertical tool slide for counterboring	259 10 500	3.3.1	Insert Type C0904CB	862 20 010
3.1.2	AVH Boring and Facing Head including vertical tool slide for counterboring and horizontal tool slide for facing bottom	259 10 570	6.1	Alignment Accessories for Resurfacing Cylinder Heads	
3.2	Tooling for Diameter Range 90-225mm		6.1.1	Guide Pin	249 71 005
3.2.1	Boring Tool Base Type B1 for diam. 90-225mm	259 12 060	6.1.2	Aligning Disk	258 79 700
3.2.2	Precision Boring Tool Type B1 Boring diameter range 90-225mm	259 12 120	6.1.3	Mounting Assembly tailored to the respective engine model(s)	on request
3.2.3	Form Boring Tool Type B1 Boring diameter range 90-225mm. For machining inclined shoulders for ease of O-ring installation	259 20 150	6.1.4	Concentricity Gauge	258 93 350
3.3	Tooling for Diameter Range 66-225mm		6.2	Alignment Accessories for Resurfacing Engine Blocks	
3.3.1	Boring Tool Base Type D1	259 14 061	6.2.1	Guide Pin	249 71 005
3.3.2	Boring Tool Base Type D1.1	259 14 062	6.2.2	Pilot Spindle	258 71 010
3.3.3	Precision Boring Tool Type D1 Boring diameter range 72-100mm	259 14 110	6.2.3	Set (2 pcs) of Centering Chucks	258 71 200
3.3.4	Form Boring Tool Type D1 Boring diameter range 72-100mm. For machining inclined shoulders for ease of O-ring installation	259 20 821	6.2.4	Sets (6pcs) of Top Jaws	on request
3.4	Insert for Precision Boring Tools B1 an D1		7.	Storage Boxes for machine and accessories	
3.4.1	Insert Type C0604HC	862 20 050	7.1	Storage Box, Standard Size	249 90 046
			7.2	Storage Box, Oversize	249 90 000



REFACING VALVE SEATS

The **VD4HD Valve Seat Refacing Machine** is composed of

- VD4HD motor drive unit,
- VD4 seat refacing gear unit attached to the motor drive unit by means of a union nut and the appropriate
- D4/xx° seat refacing head bolted the VD4 seat refacing gear unit.

The VD4HD motor drive unit is fitted with two motors providing a smooth cutting action.

The operating voltage supplied to the motors by a separate 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 range of from 100 V to 300 V.

VD4/xx° valve refacing heads are available for the popular valve face angles and also for customized seat angles.

Each D4/xx° valve refacing head features a built-in slideway for cutting tool travel to eliminate faulty angle setting operations and to ensure the same precise angle time and again.

The VD4HD valve seat refacing machine 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.

Pilots and supporting spiders supplied for an old VD4E valve seat refacing machine can be also used for the VD4HD.

The valve seat 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 insert rotates in a circle around the valve seat, a feed gear mechanism ensures a continuous outward transverse feed motion under the proper seat angle.

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

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

Setup is fast and easy.

First, lock the pilot with mounted supporting spider in the valve guide.

Then, lower the VD4HD over the pilot and, using rapid traverse lever, position the cutting edge of the cutting tool in front of the inner edge of the valve seat.

Turn micrometer downfeed to set the desired depth of cut and then select the cutting speed.

Refacing is automatic.

Pressing one button is enough to start the refacing pass.

Two to three passes are enough to restore the valve seat to the original condition.

COUNTERBORING

The **VD4HD-ADM Counterboring Machine** is composed of

- VD4HD motor drive unit and
- AV boring head attached to the motor drive unit by means of a union nut.

Two types of boring beads are available.

The standard AV boring head is provided with a vertical slide for counterboring the seat ring pockets.

The AVH 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 pilots and supporting spiders supplied for valve seat refacing can be also used for aligning the VD4HD-ADM counterboring machine in centerline with the valve guide.

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

Form boring tools are available for chamfering shoulders within the counterbores to facilitate O-ring installation.

A boring tool setting stand can be supplied as an option for presetting the precision boring tool to the desired boring diameter.

The boring tool setting stand includes a micrometer screw which can be set a diameter value near to the desired boring diameter by means of a corresponding reference disk.

To preset the precision boring tool to the desired boring diameter, the VD4HD-ADM is placed on the boring tool setting stand and then the setting of the micrometer screw is used as reference value for adjusting the precision boring tool to the desired boring diameter by means of the vernier dial.

An optional bore gauge is available as an accessory to the boring tool setting stand for checking the diameter of the seat ring bore while the pilot is inserted in the valve guide. The dial test indicator of the bore gauge is set to a value corresponding to the desired bore diameter at the tool setting stand and then the bore gauge is placed on the pilot to check the diameter of the seat ring bore

RESURFACING SEALING SURFACES

The **VD4HD-RC Face Turning Machine** is composed of

- VD4HD motor drive unit,
- VD4 seat refacing gear unit attached to the motor drive unit by means of a union nut and a
- D4.x/0° face turning head bolted the VD seat refacing gear unit.

Face turning heads is available for resurfacing seating surfaces of various diameters on cylinder heads and engine blocks.

The VD4HD-RC face turning machine is aligned square to the sealing surface by alignment accessories being mounted to the cylinder head or engine block.

Ludwig Hunger Werkzeug- und Maschinenfabrik GmbH

Mailing Address:
PO Box 70 09 60
81309 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