

**DORMER**



# Hydra High Performance Replaceable Head Drills

*Range Extension 2012*



# Features & Benefits

## MATERIAL

Replaceable heads in tough micrograin carbide and hardened steel body with high gloss nickel plating for high resistance to wear and corrosion. One body accommodates multiple head sizes with no compromise on tool rigidity and structural integrity.

## SURFACE TREATMENT

Ti-phon coating on the drilling heads for high toughness and oxidation stability - enables high speeds and feeds and resists "built-up edge" which is common when machining softer materials.

## POINT GEOMETRY

The self-centering 140° 4-facet split point geometry ensures that required thrust force is low. Pre-drilling / center drilling is neither necessary nor recommended.

## SHANK

Cylindrical shank with flat for multi-purpose tool holding. Allows accurate clamping for reliable use of internal coolant. Best results are obtained using hydraulic holders; can also be held in ER type and Weldon type toolholders.

## GEOMETRY

Heads are held securely in place by two screws; the perfect fit of body and head serrations transmits the torque evenly and allows for precise and easy assembly. The slow spiral offers optimised flute volume for efficient chip evacuation.

## INTERNAL COOLANT

Coolant holes in the drill bodies are aligned perfectly with the replaceable heads for efficient delivery of coolant directly to the cutting edge. This not only disperses the heat generated during the hole making process when using high speeds and feeds, but also ensures smooth chip evacuation and long tool life.

## HOLE DEPTH

Drilling depths of 3xDiameter and 5xDiameter:

- metric shank available for the entire range of heads
- fractional shank available up to head diameter 30.50mm

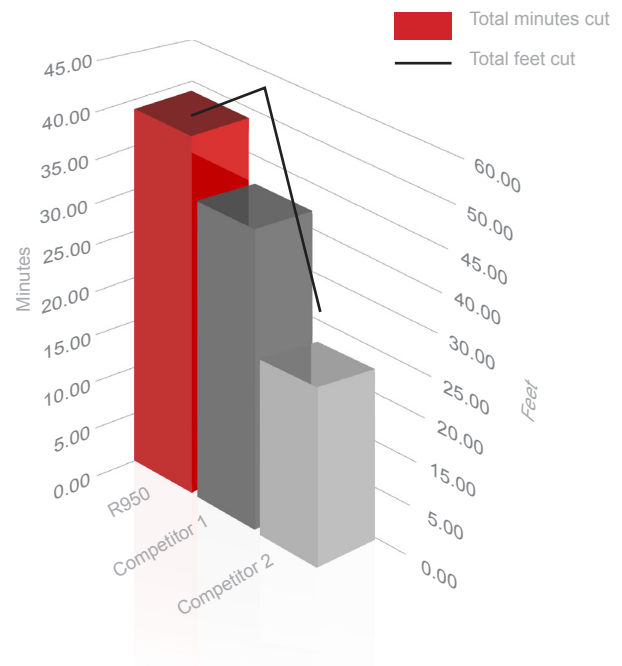
Drilling depth of 8xDiameter available on head diameters 13.50mm and larger.

## DIAMETER RANGE

R950 metric sizes available 12.0mm-42.0mm diameter and fractional sizes 15/32"-1.5/8" diameter

R960 metric sizes available 12.0mm-30.5mm diameter and fractional sizes 15/32"-1.3/16" diameter

## Test Results

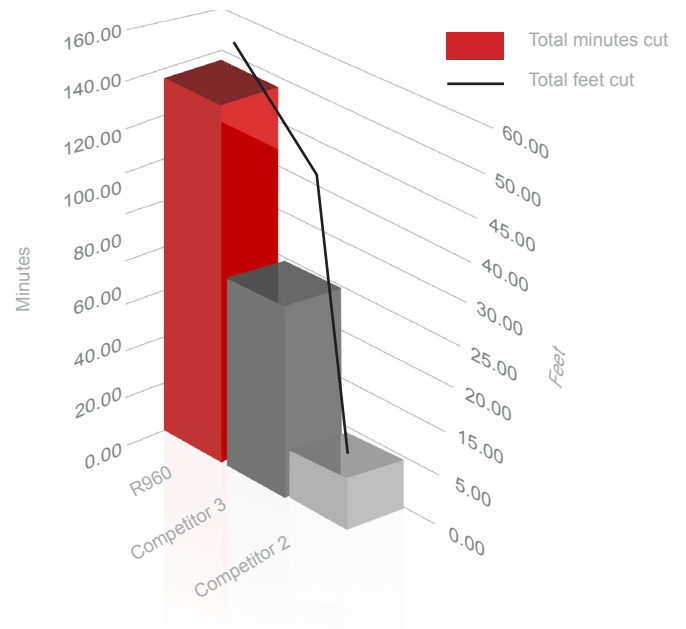


The Hydra for steel head was tested against 2 competitors at manufacturers' recommended cutting conditions in AMG 1.3. All drills were 12mm in diameter, and drilled to a hole depth of 5 x D. For all 3 tool types, the average number of minutes cut and the average number of feet cut until end of tool life were measured. The R950 drilled for almost 40 minutes, more than twice as long as Competitor 2.

# Customer *Benefits*

- High productivity across a wide range of materials, including carbon and alloy steels, stainless steel, titanium, nickel and cast iron.
- Two head types available - the R960 head has been developed specifically to give optimum performance in stainless steel and cast iron. The R950 head is recommended for steels.
- Consistently high performance, even after numerous head changes.
- Reduction in inventory costs – one drill body fits multiple head sizes.
- Easy and quick head changes with minimal interruptions to the production process. Heads can be changed without removing the body from the machine.
- Exact fit of head to body maximizes tool rigidity for superior hole accuracy and precise tolerances.
- Shank design allows for versatile tool holding.
- A choice of drilling depths, up to 8 x diameter.
- Internal coolant channels provide optimized coolant direction and pressure to give efficient chip evacuation and longer tool life.

## Test *Results*



The Hydra for stainless steel head was also tested against 2 competitors at manufacturers' recommended cutting conditions in AMG 2.2. Again, 12mm diameter drills were used to a drilling depth of 5xD. The R960 performance exceeded the nearest competitor, in terms of tool life.



# Application *Material Groups*

## Example

361 = Peripheral speed in feet/minute +/- 10%

W = Feed range - see drill feed chart below

**Feed Rate Chart**

|  $F_n$ | $\varnothing$ |        |       |       |       |         |        |
|-----------------------------------------------------------------------------------------|---------------|--------|-------|-------|-------|---------|--------|
|                                                                                         | 1/2"          | 19/32" | 5/8"  | 3/4"  | 1"    | 1.3/16" | 1.1/2" |
| S                                                                                       | 0.004         | 0.005  | 0.005 | 0.006 | 0.007 | 0.007   | 0.009  |
| T                                                                                       | 0.005         | 0.006  | 0.007 | 0.007 | 0.008 | 0.009   | 0.010  |
| U                                                                                       | 0.008         | 0.009  | 0.009 | 0.009 | 0.011 | 0.012   | 0.014  |
| V                                                                                       | 0.011         | 0.012  | 0.013 | 0.013 | 0.016 | 0.017   | 0.020  |
| W                                                                                       | 0.015         | 0.016  | 0.017 | 0.018 | 0.019 | 0.019   | 0.020  |
| inches/rev +/- 25%                                                                      |               |        |       |       |       |         |        |

| R950                                                                                  |                                                                                       |                                                                                       | R960                                                                                  |                                                                                       |                                                                                       |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|    | HM                                                                                    |    |    | Ti-phon                                                                               |    |
|    |                                                                                       |                                                                                       |    |                                                                                       |                                                                                       |
| H853                                                                                  | H855                                                                                  | H858                                                                                  | H853                                                                                  | H855                                                                                  | H858                                                                                  |
|    |    |    |    |    |    |
|    |    |    |    |    |    |
| 3XD                                                                                   | 5XD                                                                                   | 8XD                                                                                   | 3XD                                                                                   | 5XD                                                                                   | 8XD                                                                                   |
| HSS                                                                                   | HSS                                                                                   | HSS                                                                                   | HSS                                                                                   | HSS                                                                                   | HSS                                                                                   |
|    |    |    |    |    |    |
|    |    |    |    |    |    |
| DIN 6535HB<br>DIN 6535HE                                                              | DIN 6535HB<br>DIN 6535HE                                                              | DIN 6535HB<br>DIN 6535HE                                                              | DIN 6535HB<br>DIN 6535HE                                                              | DIN 6535HB<br>DIN 6535HE                                                              | DIN 6535HB<br>DIN 6535HE                                                              |
|  |  |  |  |  |  |

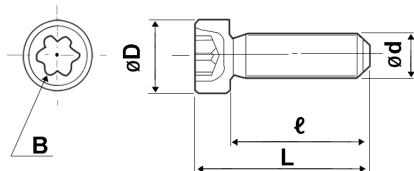
**Application Material Groups (AMG)**

|                        |                                                                |                                                        | Hardness<br>HB | Tensile<br>Strength | 15/32" -<br>42.00 | 15/32" -<br>42.00 | 15/32" -<br>42.00 | 15/32" -<br>30.50 | 15/32" -<br>30.50 | 13.50 -<br>30.50 |
|------------------------|----------------------------------------------------------------|--------------------------------------------------------|----------------|---------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------------|
| 1. Steel               | 1.1 Magnetic soft steel                                        | 12L14, 12L15                                           | <120           | N/mm                | 361W              | 361V              | 328U              |                   |                   |                  |
|                        | 1.2 Structural Steel / case carburising steel                  | 1005-1025, 1214, 1215, A36                             | <200           | <700                | 328W              | 328V              | 295U              |                   |                   |                  |
|                        | 1.3 Plain Carbon steel                                         | 1030-1060, 1050-1060, 1144-1146                        | <250           | <850                | 328W              | 328V              | 295U              |                   |                   |                  |
|                        | 1.4 Alloy steel                                                | 4140, 4340, 52100, 8620 H11-H41, A2, D2, 01, P20, 420  | <250           | <850                | 279W              | 279V              | 246U              |                   |                   |                  |
|                        | 1.5 Alloy steel/ Hardened and tempered steel                   | 4140, 4340, 52100, 8620 H11-H41, A2, D2, 01, P20, 420  | >250 <350      | >850 <1200          | 279W              | 279V              | 246U              |                   |                   |                  |
|                        | 1.6 Alloy steel/ Hardened and tempered steel                   | 4140, 4340, 52100, 8620 H11-H41, A2, D2, 01, P20, 420  | >350           | >1200 <1620         | 230U              | 213U              | 197T              |                   |                   |                  |
|                        | 1.7 Alloy steel Hardened                                       | A2-D2, H10-H41, L1-L6, M1-M42, T1                      | 49-55HRC       | >1620               |                   |                   |                   |                   |                   |                  |
|                        | 1.8 Alloy steel Hardened                                       | A2-D2, H10-H41, L1-L6, M1-M42, T1                      | 55-63HRC       | <1960               |                   |                   |                   |                   |                   |                  |
| 2. Stainless Steel     | 2.1 Free machining Stainless Steel                             | 200, 303, 416, 420F, 430F, 440                         | <250           | <850                |                   |                   |                   | 197V              | 164V              | 148U             |
|                        | 2.2 Austenitic                                                 | 301, 302, 304, 316, 321, 330, CUSTOM 455, AM-350       | <320           | <1100               |                   |                   |                   | 164T              | 164S              | 131S             |
|                        | 2.3 Ferritic + Austenitic, Martensitic                         | 318-329, 400-446, 15-4PH, 17-4PH, DUPLEX               | <300           | <1000               |                   |                   |                   | 131T              | 131S              | 115S             |
|                        | 2.4 Precipitation Hardened                                     | 15-5PH, Custom 450 17-4PH                              | >320 <410      | >1100 <1400         |                   |                   |                   | 115T              | 115S              | 98S              |
| 3. Cast Iron           | 3.1 Lamellar graphite                                          | Grey, G10, Gg40, J431C, A48 CLASS 20                   | <150           | <500                |                   |                   |                   | 394V              | 374V              | 348U             |
|                        | 3.2 Lamellar graphite                                          | Grey, GG25-Gg40, J158, A48 CLASS 40-60                 | >150 <300      | >500 <1000          |                   |                   |                   | 380V              | 354V              | 328U             |
|                        | 3.3 Nodular graphite/ Malleable Cast Iron                      | A220, A436, A439, A602, Black, GGG40-GGG70             | <200           | <700                |                   |                   |                   | 289V              | 279V              | 262U             |
|                        | 3.4 Nodular graphite/ Malleable Cast Iron                      | Black Gts/Gtw, J434C                                   | >200 <300      | >700 <1000          |                   |                   |                   | 289V              | 279V              | 262U             |
| 4. Titanium            | 4.1 Titanium, unalloyed                                        | Commercially Pure                                      | <200           | <700                |                   |                   |                   | 148T              | 148T              | 115S             |
|                        | 4.2 Titanium, alloyed                                          | 6A14V, 6A14V-2Sn, Monel, Monel K                       | <270           | <900                |                   |                   |                   | 115T              | 115T              | 98S              |
|                        | 4.3 Titanium, alloyed                                          | 6A14V-4Mo, 7A14V-4Mo, 4911-4967                        | >270 <350      | >900 <1250          |                   |                   |                   | 98S               | 98S               | 82S              |
| 5. Nickel              | 5.1 Nickel, unalloyed                                          | Commercially Pure, 17644, 200, 5553                    | <150           | <500                |                   |                   |                   | 115T              | 115T              | 98S              |
|                        | 5.2 Nickel, alloyed                                            | Monel 400, Hastelloy C, Inconel 625, Waspaloy          | <270           | <900                |                   |                   |                   | 98S               | 98S               | 82S              |
|                        | 5.3 Nickel, alloyed                                            | Inconel 718, Nimonic 75-95, Rene 41, Inconel 825, A286 | >270 <350      | >900 <1200          |                   |                   |                   | 82S               | 82S               | 66S              |
| 6. Copper              | 6.1 Copper                                                     | Commercially Pure                                      | <100           | <350                |                   |                   |                   |                   |                   |                  |
|                        | 6.2 $\beta$ -Brass, Bronze                                     | 314-340, 350-370                                       | <200           | <700                |                   |                   |                   |                   |                   |                  |
|                        | 6.3 $\alpha$ -Brass                                            | Alloyed Cu + Al + Fe, Long Chipping                    | <200           | <700                |                   |                   |                   |                   |                   |                  |
|                        | 6.4 High Strength Bronze                                       | Ampco 18-25                                            | <470           | <1500               |                   |                   |                   |                   |                   |                  |
| 7. Aluminium Magnesium | 7.1 Al, Mg, unalloyed                                          | Commercially Pure                                      | <100           | <350                |                   |                   |                   |                   |                   |                  |
|                        | 7.2 Al alloyed, Si<0.5%                                        | 6061 T6, 7075, 314-340                                 | <150           | <500                |                   |                   |                   |                   |                   |                  |
|                        | 7.3 Al alloyed, Si>0.5%<10%                                    | 6061 T6, 380-390                                       | <120           | <400                |                   |                   |                   |                   |                   |                  |
|                        | 7.4 Al alloyed, Si>10% Whisker reinforced Al-alloys, Mg alloys | Magnesium Whisker Reinforced                           | <120           | <400                |                   |                   |                   |                   |                   |                  |
| 8. Synthetic Materials | 8.1 Thermoplastics                                             | Ultramid, Polystrol                                    | ---            | ---                 |                   |                   |                   |                   |                   |                  |
|                        | 8.2 Thermosetting plastics                                     | Bakelit, Pertinax                                      | ---            | ---                 |                   |                   |                   |                   |                   |                  |
|                        | 8.3 Reinforced plastic materials                               | CFK, GFKAFK                                            | ---            | ---                 |                   |                   |                   |                   |                   |                  |
| 9. Hard Materials      | 9.1 Cermets (Metal-ceramics)                                   | Ferrotic                                               | <550           | <1700               |                   |                   |                   |                   |                   |                  |
| 10. Graphite           | 10.1 Standard graphite                                         |                                                        | ---            | <100                |                   |                   |                   |                   |                   |                  |

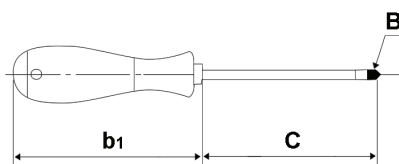
# Torque Table

|  |  |  |                                  |               | TORQUE<br>VALUES Nm<br>(metric System) | TORQUE<br>VALUES in/lbs<br>(inch System) |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------|---------------|----------------------------------------|------------------------------------------|
| H860                                                                              | H861                                                                              | H853 3xD                                                                          | H855 5xD                         | H858 8xD      |                                        |                                          |
| H860N1                                                                            | H861N1                                                                            | 12.0mm-15.0mm<br>31/64"-39/64"                                                    | 12.0mm-15.0mm<br>31/64"-39/64"   | 14.0mm-15.0mm | 0.75-0.99                              | 6.6-8.8                                  |
| H860N2                                                                            | H861N2                                                                            | 16.0mm-18.0mm<br>41/64"-23/32"                                                    | 16.0mm-18.0mm<br>41/64"-23/32"   | 16.0mm-18.0mm | 0.93-1.24                              | 8.2-11.0                                 |
| H860N3                                                                            | H861N3                                                                            | 19.0mm-21.0mm<br>49/64"-27/32"                                                    | 19.0mm-21.0mm<br>49/64"-27/32"   | 19.0mm-21.0mm | 1.84-2.44                              | 16.3-21.6                                |
| H860N4                                                                            | H861N3                                                                            | 22.0mm-24.0mm<br>57/64"-31/32"                                                    | 22.0mm-24.0mm<br>57/64"-31/32"   | 22.0mm-24.0mm | 2.73-3.72                              | 24.2-32.9                                |
| H860N5                                                                            | H861N4                                                                            | 25.0mm-27.0mm<br>1.1/64"-1.3/32"                                                  | 25.0mm-27.0mm<br>1.1/64"-1.3/32" | 25.0mm-27.0mm | 4.14-5.52                              | 36.6-48.8                                |
| H860N6                                                                            | H861N5                                                                            | 28.0mm-33.5mm<br>1.1/8"-1.3/16"                                                   | 28.0mm-33.5mm<br>1.1/8"-1.3/16"  | 28.0mm-33.5mm | 4.97-6.63                              | 44.0-58.7                                |
| H860N7                                                                            | H861N6                                                                            | 35.0mm-42.5mm                                                                     | 35.0mm-42.5mm                    | 35.0mm-42.5mm | 7.20                                   | 63.7                                     |

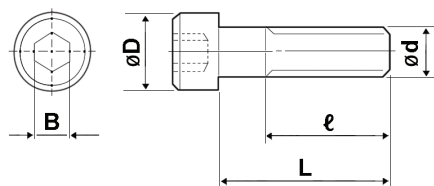
## Screws and screw-drivers data



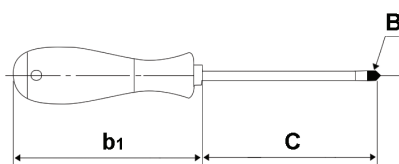
| e-code | d    | Pitch | L (mm) | l (mm) | D (mm) | B    |
|--------|------|-------|--------|--------|--------|------|
| H860N1 | M2.2 | 0.45  | 7.5    | 5.7    | 3.5    | 8IP  |
| H860N2 | M2.5 | 0.45  | 9.0    | 7.0    | 4.1    | 10IP |
| H860N3 | M3.0 | 0.50  | 10.5   | 8.0    | 4.9    | 15IP |
| H860N4 | M3.5 | 0.60  | 11.5   | 8.8    | 5.5    | 15IP |
| H860N5 | M4.0 | 0.70  | 12.5   | 9.5    | 6.0    | 20IP |
| H860N6 | M4.5 | 0.75  | 14.3   | 10.8   | 6.8    | 25IP |



| code   | B    | C   | b1  |
|--------|------|-----|-----|
| H861N1 | 8IP  | 60  | 104 |
| H861N2 | 10IP | 80  | 111 |
| H861N3 | 15IP | 80  | 111 |
| H861N4 | 20IP | 100 | 118 |
| H861N5 | 25IP | 100 | 118 |



| e-code | d    | Pitch | L (mm) | l (mm) | D (mm) | B |
|--------|------|-------|--------|--------|--------|---|
| H860N7 | M5.0 | 0.8   | 15     | FULL   | 8.5    | 4 |



| e-code | B | C  | b1  |
|--------|---|----|-----|
| H861N6 | 4 | 75 | 111 |



## R950 • Hydra Drill Head for Steel

Replaceable heads in tough micro-grain carbide for quick and easy tool changes. High productivity in a wide range of steels. Superior hole accuracy and precise repeatable tolerances. Special Ti-phon coating for longer tool life.

**1.1 1.2 1.3 1.4 1.5 1.6**

## R960 • Hydra Drill Head for Stainless Steel

Replaceable heads in tough micro-grain carbide for quick and easy tool changes. High productivity across a wide range of stainless steel, cast iron & heat resistant materials. Superior hole accuracy and precise repeatable tolerances. Special Ti-phon coating for longer tool life.

**2.1 2.2 2.3 2.4 3.1 3.2 3.3 3.4**

**4.1 4.2 4.3 5.1 5.2 5.3**

*New larger diameter heads now available.*

| R950                                                                                | R960                                                                                |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |
|  |  |
| 15/32 - 42.00                                                                       | 15/32 - 30.50                                                                       |

| d <sub>1</sub><br>Ø<br>Inch | d <sub>1</sub><br>Ø<br>mm | d <sub>1</sub><br>decimal<br>Inch | l <sub>1</sub><br>mm | R950      |         | R960      |         |
|-----------------------------|---------------------------|-----------------------------------|----------------------|-----------|---------|-----------|---------|
|                             |                           |                                   |                      | E-Code    | EDP#    | E-Code    | EDP#    |
| 15/32                       | 11.91                     | 0.4689                            | 9.1                  | R95015/32 | 0010860 | R96015/32 | 0013472 |
|                             | 12.00                     | 0.4724                            | 9.1                  | R95012.0  | 0010877 | R96012.0  | 0013489 |
|                             | 12.10                     | 0.4764                            | 9.1                  | R95012.1  | 0037904 | R96012.1  | 0038338 |
|                             | 12.20                     | 0.4803                            | 9.1                  | R95012.2  | 0037911 | R96012.2  | 0038376 |
| 31/64                       | 12.30                     | 0.4843                            | 9.1                  | R95031/64 | 0010884 | R96031/64 | 0013496 |
|                             | 12.50                     | 0.4921                            | 9.4                  | R95012.5  | 0010907 | R96012.5  | 0013519 |
|                             | 12.60                     | 0.4961                            | 9.4                  | R95012.6  | 0037928 | R96012.6  | 0038413 |
| 1/2                         | 12.70                     | 0.5000                            | 9.4                  | R9501/2   | 0010914 | R9601/2   | 0013526 |
|                             | 12.80                     | 0.5039                            | 9.4                  | R95012.8  | 0037935 | R96012.8  | 0038437 |
|                             | 12.90                     | 0.5079                            | 9.4                  | R95012.9  | 0037942 | R96012.9  | 0038451 |
|                             | 13.00                     | 0.5118                            | 9.7                  | R95013.0  | 0010921 | R96013.0  | 0013533 |
| 33/64                       | 13.10                     | 0.5157                            | 9.7                  | R95033/64 | 0010938 | R96033/64 | 0013540 |
|                             | 13.20                     | 0.5197                            | 9.7                  | R95013.2  | 0037959 | R96013.2  | 0038468 |
| 17/32                       | 13.49                     | 0.5311                            | 9.7                  | R95017/32 | 0010945 | R96017/32 | 0013557 |
|                             | 13.50                     | 0.5315                            | 10.3                 | R95013.5  | 0010952 | R96013.5  | 0016022 |
|                             | 13.60                     | 0.5354                            | 10.3                 | R95013.6  | 0037966 | R96013.6  | 0038499 |
|                             | 13.70                     | 0.5394                            | 10.3                 | R95013.7  | 0037973 | R96013.7  | 0038529 |
| 35/64                       | 13.80                     | 0.5433                            | 10.3                 | R95013.8  | 0037980 | R96013.8  | 0038543 |
|                             | 13.89                     | 0.5469                            | 10.3                 | R95035/64 | 0010969 | R96035/64 | 0016039 |
|                             | 14.00                     | 0.5512                            | 10.3                 | R95014.0  | 0010983 | R96014.0  | 0016046 |
|                             | 14.10                     | 0.5551                            | 10.3                 | R95014.1  | 0037997 | R96014.1  | 0038567 |
| 9/16                        | 14.20                     | 0.5591                            | 10.3                 | R95014.2  | 0038000 | R96014.2  | 0038574 |
|                             | 14.29                     | 0.5626                            | 10.3                 | R9509/16  | 0011003 | R9609/16  | 0016053 |
|                             | 14.50                     | 0.5709                            | 10.3                 | R95014.5  | 0011010 | R96014.5  | 0016060 |
|                             | 14.60                     | 0.5748                            | 11.0                 | R95014.6  | 0038017 | R96014.6  | 0038581 |
| 37/64                       | 14.68                     | 0.5780                            | 11.0                 | R95037/64 | 0011140 | R96037/64 | 0016077 |
|                             | 14.70                     | 0.5787                            | 11.0                 | R95014.7  | 0038024 | R96014.7  | 0039601 |
|                             | 14.80                     | 0.5827                            | 11.0                 | R95014.8  | 0038031 | R96014.8  | 0039618 |
|                             | 15.00                     | 0.5906                            | 11.0                 | R95015.0  | 0011201 | R96015.0  | 0016084 |
| 19/32                       | 15.08                     | 0.5937                            | 11.0                 | R95019/32 | 0011218 | R96019/32 | 0016091 |
|                             | 15.10                     | 0.5945                            | 11.0                 | R95015.1  | 0038048 | R96015.1  | 0039625 |
|                             | 15.20                     | 0.5984                            | 11.0                 | R95015.2  | 0038055 | R96015.2  | 0039632 |

| d <sub>1</sub><br>Ø<br>Inch | d <sub>1</sub><br>Ø<br>mm | d <sub>1</sub><br>decimal<br>Inch | l <sub>1</sub><br>mm | R950      |         | R960      |         |
|-----------------------------|---------------------------|-----------------------------------|----------------------|-----------|---------|-----------|---------|
|                             |                           |                                   |                      | E-Code    | EDP#    | E-Code    | EDP#    |
|                             | 15.24                     | 0.6000                            | 11.0                 | R95015.24 | 0032268 | R96015.24 | 0032350 |
| 39/64                       | 15.48                     | 0.6094                            | 11.0                 | R95039/64 | 0011232 | R96039/64 | 0016107 |
|                             | 15.50                     | 0.6102                            | 11.0                 | R95015.5  | 0011362 | R96015.5  | 0016114 |
|                             | 15.60                     | 0.6142                            | 11.6                 | R95015.6  | 0038062 | R96015.6  | 0039649 |
|                             | 15.70                     | 0.6181                            | 11.6                 | R95015.7  | 0038079 | R96015.7  | 0039656 |
| 5/8                         | 15.88                     | 0.6252                            | 11.6                 | R9505/8   | 0011379 | R9605/8   | 0016121 |
|                             | 16.00                     | 0.6299                            | 11.6                 | R95016.0  | 0011386 | R96016.0  | 0016138 |
|                             | 16.08                     | 0.6331                            | 11.6                 | R95016.08 | 0032275 | R96016.08 | 0032367 |
|                             | 16.10                     | 0.6339                            | 11.6                 | R95016.1  | 0038086 | R96016.1  | 0039663 |
|                             | 16.20                     | 0.6378                            | 11.6                 | R95016.2  | 0038093 | R96016.2  | 0039670 |
| 41/64                       | 16.27                     | 0.6406                            | 11.6                 | R95041/64 | 0011393 | R96041/64 | 0016145 |
|                             | 16.30                     | 0.6417                            | 11.6                 | R9506.3   | 0032282 | R9606.3   | 0032374 |
|                             | 16.50                     | 0.6496                            | 11.6                 | R95016.5  | 0011409 | R96016.5  | 0016152 |
|                             | 16.60                     | 0.6535                            | 12.2                 | R95016.6  | 0038109 | R96016.6  | 0039687 |
| 21/32                       | 16.67                     | 0.6563                            | 12.2                 | R95021/32 | 0012161 | R96021/32 | 0016169 |
|                             | 16.70                     | 0.6575                            | 12.2                 | R95016.7  | 0038116 | R96016.7  | 0039694 |
|                             | 17.00                     | 0.6693                            | 12.2                 | R95017.0  | 0012185 | R96017.0  | 0016176 |
| 43/64                       | 17.07                     | 0.6720                            | 12.2                 | R95043/64 | 0012215 | R96043/64 | 0016183 |
|                             | 17.10                     | 0.6732                            | 12.2                 | R95017.1  | 0038123 | R96017.1  | 0039700 |
|                             | 17.20                     | 0.6772                            | 12.2                 | R95017.2  | 0038130 | R96017.2  | 0039717 |
| 11/16                       | 17.46                     | 0.6874                            | 12.2                 | R95011/16 | 0012239 | R96011/16 | 0016190 |
|                             | 17.50                     | 0.6890                            | 12.2                 | R95017.5  | 0012253 | R96017.5  | 0016503 |
|                             | 17.60                     | 0.6929                            | 12.9                 | R95017.6  | 0032299 | R96017.6  | 0032381 |
|                             | 17.70                     | 0.6969                            | 12.9                 | R95017.7  | 0038147 | R96017.7  | 0039724 |
| 45/64                       | 17.86                     | 0.7031                            | 12.9                 | R95045/64 | 0012260 | R96045/64 | 0016640 |
|                             | 18.00                     | 0.7087                            | 12.9                 | R95018.0  | 0012277 | R96018.0  | 0016664 |
|                             | 18.10                     | 0.7126                            | 12.9                 | R95018.1  | 0038154 | R96018.1  | 0039731 |
|                             | 18.20                     | 0.7165                            | 12.9                 | R95018.2  | 0038161 | R96018.2  | 0039748 |
| 23/32                       | 18.26                     | 0.7189                            | 12.9                 | R95023/32 | 0012284 | R96023/32 | 0016671 |
|                             | 18.50                     | 0.7283                            | 12.9                 | R95018.5  | 0012307 | R96018.5  | 0016688 |
|                             | 18.60                     | 0.7323                            | 13.5                 | R95018.6  | 0038178 | R96018.6  | 0039755 |
| 47/64                       | 18.65                     | 0.7343                            | 13.5                 | R95047/64 | 0012321 | R96047/64 | 0016695 |
|                             | 18.70                     | 0.7362                            | 13.5                 | R95018.7  | 0038185 | R96018.7  | 0039762 |
|                             | 18.90                     | 0.7441                            | 13.5                 | R95018.9  | 0038192 | R96018.9  | 0039779 |
|                             | 19.00                     | 0.7480                            | 13.5                 | R95019.0  | 0012338 | R96019.0  | 0016817 |
| 3/4                         | 19.05                     | 0.7500                            | 13.5                 | R9503/4   | 0012345 | R9603/4   | 0016879 |
|                             | 19.10                     | 0.7520                            | 13.5                 | R95019.1  | 0038208 | R96019.1  | 0039786 |
|                             | 19.20                     | 0.7559                            | 13.5                 | R95019.2  | 0038215 | R96019.2  | 0039793 |
|                             | 19.25                     | 0.7579                            | 13.5                 | R95019.25 | 0032305 | R96019.25 | 0032398 |
|                             | 19.30                     | 0.7598                            | 13.5                 | R95019.3  | 0032312 | R96019.3  | 0032404 |
|                             | 19.35                     | 0.7618                            | 13.5                 | R95019.35 | 0032329 | R96019.35 | 0032411 |
| 49/64                       | 19.45                     | 0.7657                            | 13.5                 | R95049/64 | 0012376 | R96049/64 | 0016886 |
|                             | 19.50                     | 0.7677                            | 13.5                 | R95019.5  | 0012383 | R96019.5  | 0016947 |
|                             | 19.60                     | 0.7717                            | 14.1                 | R95019.6  | 0038222 | R96019.6  | 0039809 |
|                             | 19.70                     | 0.7756                            | 14.1                 | R95019.7  | 0038239 | R96019.7  | 0039816 |
| 25/32                       | 19.84                     | 0.7811                            | 14.1                 | R95025/32 | 0012406 | R96025/32 | 0016954 |
|                             | 20.00                     | 0.7874                            | 14.1                 | R95020.0  | 0012413 | R96020.0  | 0017111 |
| 51/64                       | 20.24                     | 0.7969                            | 14.1                 | R95051/64 | 0012437 | R96051/64 | 0017128 |
|                             | 20.50                     | 0.8071                            | 14.1                 | R95020.5  | 0012451 | R96020.5  | 0017159 |
| 13/16                       | 20.64                     | 0.8126                            | 14.8                 | R95013/16 | 0012468 | R96013/16 | 0017197 |
|                             | 21.00                     | 0.8268                            | 14.8                 | R95021.0  | 0012475 | R96021.0  | 0017166 |
| 53/64                       | 21.03                     | 0.828                             | 14.8                 | R95053/64 | 0012536 | R96053/64 | 0017203 |
| 27/32                       | 21.43                     | 0.8437                            | 14.8                 | R95027/32 | 0012550 | R96027/32 | 0017227 |
|                             | 21.50                     | 0.8465                            | 14.8                 | R95021.5  | 0012574 | R96021.5  | 0017234 |
| 55/64                       | 21.83                     | 0.8594                            | 15.0                 | R95055/64 | 0012604 | R96055/64 | 0017241 |
|                             | 22.00                     | 0.8661                            | 15.0                 | R95022.0  | 0012628 | R96022.0  | 0017258 |
| 7/8                         | 22.22                     | 0.8748                            | 15.0                 | R9507/8   | 0012635 | R9607/8   | 0017371 |
|                             | 22.50                     | 0.8858                            | 15.0                 | R95022.5  | 0032336 | R96022.5  | 0032428 |
| 57/64                       | 22.62                     | 0.8906                            | 15.0                 | R95057/64 | 0012642 | R96057/64 | 0017401 |
|                             | 22.70                     | 0.8937                            | 15.0                 | R95022.7  | 0038246 | R96022.7  | 0039823 |
|                             | 23.00                     | 0.9055                            | 15.1                 | R95023.0  | 0012666 | R96023.0  | 0017425 |
| 29/32                       | 23.02                     | 0.9063                            | 15.1                 | R95029/32 | 0012673 | R96029/32 | 0017432 |
| 59/64                       | 23.42                     | 0.9220                            | 15.1                 | R95059/64 | 0012680 | R96059/64 | 0017456 |
|                             | 23.50                     | 0.9252                            | 15.1                 | R95023.5  | 0038253 | R96023.5  | 0039830 |
| 15/16                       | 23.81                     | 0.9374                            | 15.4                 | R95015/16 | 0012703 | R96015/16 | 0017562 |



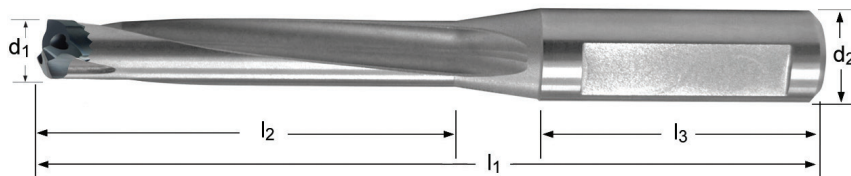
| d <sub>1</sub><br>Ø<br>Inch | d <sub>1</sub><br>Ø<br>mm | d <sub>1</sub><br>decimal<br>Inch | l <sub>1</sub><br>mm | R950        |          | R960        |         |
|-----------------------------|---------------------------|-----------------------------------|----------------------|-------------|----------|-------------|---------|
|                             |                           |                                   |                      | E-Code      | EDP#     | E-Code      | EDP#    |
|                             | 24.00                     | 0.9449                            | 15.4                 | R95024.0    | 0012727  | R96024.0    | 0017579 |
| 61/64                       | 24.21                     | 0.9531                            | 15.4                 | R95061/64   | 0012741  | R96061/64   | 0017586 |
|                             | 24.50                     | 0.9646                            | 15.4                 | R95024.5    | 0038260  | R96024.5    | 0039847 |
| 31/32                       | 24.61                     | 0.9689                            | 15.4                 | R95031/32   | 0012772  | R96031/32   | 0017593 |
|                             | 25.00                     | 0.9843                            | 15.8                 | R95025.0    | 0012826  | R96025.0    | 0017746 |
| 63/64                       | 25.00                     | 0.9843                            | 15.8                 | R95063/64   | 0012819  | R96063/64   | 0017722 |
| 1"                          | 25.40                     | 1.0000                            | 15.8                 | R9501       | 0012833  | R9601       | 0017753 |
|                             | 25.50                     | 1.0039                            | 15.8                 | R95025.5    | 0038277  | R96025.5    | 0039854 |
|                             | 25.65                     | 1.0098                            | 15.8                 | R95025.65   | 0032343  | R96025.65   | 0032435 |
| 1.1/64                      | 25.80                     | 1.0157                            | 15.8                 | R9501.1/64  | 0012840  | R9601.1/64  | 0018958 |
|                             | 26.00                     | 1.0236                            | 16.4                 | R95026.0    | 0013090  | R96026.0    | 0018965 |
| 1.1/32                      | 26.19                     | 1.0311                            | 16.4                 | R9501.1/32  | 0013120  | R9601.1/32  | 0018972 |
|                             | 26.50                     | 1.0433                            | 16.4                 | R95026.5    | 0038284  | R96026.5    | 0039878 |
| 1.3/64                      | 26.59                     | 1.0469                            | 16.4                 | R9501.3/64  | 0013229  | R9601.3/64  | 0018989 |
| 1.1/16                      | 26.99                     | 1.0626                            | 17.1                 | R9501.1/16  | 0013243  | R9601.1/16  | 0018996 |
|                             | 27.00                     | 1.0630                            | 17.1                 | R95027.0    | 0013267  | R96027.0    | 0019009 |
| 1.5/64                      | 27.38                     | 1.0780                            | 17.1                 | R9501.5/64  | 0013274  | R9601.5/64  | 0019016 |
|                             | 27.50                     | 1.0827                            | 17.1                 | R95027.5    | 0038291  | R96027.5    | 0039885 |
| 1.3/32                      | 27.78                     | 1.0937                            | 17.1                 | R9501.3/32  | 0013281  | R9601.3/32  | 0019023 |
|                             | 28.00                     | 1.1024                            | 17.7                 | R95028.0    | 0013304  | R96028.0    | 0019030 |
| 1.7/64                      | 28.18                     | 1.1094                            | 17.7                 | R9501.7/64  | 0013311  | R9601.7/64  | 0019047 |
|                             | 28.50                     | 1.1220                            | 17.7                 | R95028.5    | 0038307  | R96028.5    | 0039892 |
| 1.1/8                       | 28.58                     | 1.1252                            | 17.7                 | R9501.1/8   | 0013328  | R9601.1/8   | 0019054 |
| 1.9/64                      | 28.97                     | 1.1406                            | 18.3                 | R9501.9/64  | 0013342  | R9601.9/64  | 0019061 |
|                             | 29.00                     | 1.1417                            | 18.3                 | R95029.0    | 0013366  | R96029.0    | 0019078 |
| 1.5/32                      | 29.37                     | 1.1563                            | 18.3                 | R9501.5/32  | 0013380  | R9601.5/32  | 0019085 |
|                             | 29.50                     | 1.1614                            | 18.3                 | R95029.5    | 0038314  | R96029.5    | 0039908 |
| 1.11/64                     | 29.77                     | 1.1720                            | 18.3                 | R9501.11/64 | 0013427  | R9601.11/64 | 0019092 |
|                             | 30.00                     | 1.1811                            | 19.0                 | R95030.0    | 0013434  | R96030.0    | 0019108 |
| 1.3/16                      | 30.16                     | 1.1874                            | 19.0                 | R9501.3/16  | 0013441  | R9601.3/16  | 0019115 |
|                             | 30.50                     | 1.2008                            | 19.0                 | R95030.5    | 0013465  | R96030.5    | 0019122 |
| 1.7/32                      | 30.96                     | 1.2189                            | 21.0                 | R9501.7/32  | 46104481 | —           | —       |
|                             | 31.00                     | 1.2205                            | 21.0                 | R95031.0    | 46104482 | —           | —       |
| 1.1/4                       | 31.75                     | 1.2500                            | 21.0                 | R9501.1/4   | 46104483 | —           | —       |
|                             | 32.00                     | 1.2598                            | 21.0                 | R95032.0    | 46104484 | —           | —       |
|                             | 32.50                     | 1.2795                            | 21.0                 | R95032.5    | 46104485 | —           | —       |
| 1.19/64                     | 32.94                     | 1.2969                            | 21.0                 | R9501.19/64 | 46104486 | —           | —       |
|                             | 33.00                     | 1.2992                            | 21.0                 | R95033.0    | 46104487 | —           | —       |
|                             | 33.50                     | 1.3189                            | 21.0                 | R95033.5    | 46104488 | —           | —       |
|                             | 34.00                     | 1.3386                            | 23.0                 | R95034.0    | 46104489 | —           | —       |
| 1.11/32                     | 34.13                     | 1.3437                            | 23.0                 | R9501.11/32 | 46104530 | —           | —       |
|                             | 34.50                     | 1.3583                            | 23.0                 | R95034.5    | 46104531 | —           | —       |
| 1.3/8                       | 34.93                     | 1.3752                            | 23.0                 | R9501.3/8   | 46104532 | —           | —       |
|                             | 35.00                     | 1.3780                            | 23.0                 | R95035.0    | 46104533 | —           | —       |
|                             | 36.00                     | 1.4173                            | 23.0                 | R95036.0    | 46104534 | —           | —       |
| 1.27/64                     | 36.12                     | 1.4220                            | 23.0                 | R9501.27/64 | 46104535 | —           | —       |
|                             | 36.50                     | 1.4370                            | 23.0                 | R95036.5    | 46104536 | —           | —       |
|                             | 37.00                     | 1.4567                            | 25.0                 | R95037.0    | 46104537 | —           | —       |
| 1.15/32                     | 37.31                     | 1.4689                            | 25.0                 | R9501.15/32 | 46104538 | —           | —       |
|                             | 37.50                     | 1.4764                            | 25.0                 | R95037.5    | 46104539 | —           | —       |
|                             | 38.00                     | 1.4961                            | 25.0                 | R95038.0    | 46104540 | —           | —       |
| 1.1/2                       | 38.10                     | 1.5000                            | 25.0                 | R9501.1/2   | 46104541 | —           | —       |
|                             | 38.50                     | 1.5157                            | 25.0                 | R95038.5    | 46104542 | —           | —       |
| 1.17/32                     | 38.89                     | 1.5311                            | 25.0                 | R9501.17/32 | 46104543 | —           | —       |
|                             | 39.00                     | 1.5354                            | 25.0                 | R95039.0    | 46104544 | —           | —       |
|                             | 39.50                     | 1.5551                            | 25.0                 | R95039.5    | 46104545 | —           | —       |
| 1.9/16                      | 39.69                     | 1.5626                            | 27.0                 | R9501.9/16  | 46104546 | —           | —       |
|                             | 40.00                     | 1.5748                            | 27.0                 | R95040.0    | 46104547 | —           | —       |
|                             | 41.00                     | 1.6142                            | 27.0                 | R95041.0    | 46104548 | —           | —       |
| 1.5/8                       | 41.28                     | 1.6252                            | 27.0                 | R9501.5/8   | 46104549 | —           | —       |
|                             | 42.00                     | 1.6535                            | 27.0                 | R95042.0    | 46104550 | —           | —       |





## H853 • Hydra Body 3xD

Cylindrical shank with flat for multi-purpose tool holding.  
Allows accurate clamping for reliable use of internal coolant.



Four (4) screws and one (1) screwdriver are included with a drill body

|                | Hydra Body 3xD<br>Metric Shank |                      |                      |                      |                      |  | Hydra Body 3xD<br>Fractional Shank |                      |                      |                      |                        |  |  |  |
|-------------------------------------------------------------------------------------------------|--------------------------------|----------------------|----------------------|----------------------|----------------------|-----------------------------------------------------------------------------------|------------------------------------|----------------------|----------------------|----------------------|------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| d <sub>1</sub><br>Ø                                                                             | H853<br>e-Code<br>EDP#         | l <sub>2</sub><br>mm | l <sub>1</sub><br>mm | l <sub>3</sub><br>mm | d <sub>2</sub><br>mm | H853<br>e-Code<br>EDP#                                                            | l <sub>2</sub><br>mm               | l <sub>1</sub><br>mm | l <sub>3</sub><br>mm | d <sub>2</sub><br>mm | d <sub>2</sub><br>inch | H860<br>e-Code<br>EDP#                                                              | H861<br>e-Code<br>EDP#                                                              |                                                                                     |
| 15/32<br>12.00<br>12.10<br>12.20<br>31/64                                                       | H85312.0<br>0017777            | 44.0                 | 105.0                | 48.0                 | 16.0                 | H85331/64<br>0033043                                                              | 44.0                               | 105.0                | 48.0                 | 15.88                | 5/8                    | H860N1<br>0018835                                                                   | H861N1<br>0018897                                                                   |                                                                                     |
| 12.50<br>12.60<br>1/2<br>12.80<br>12.90                                                         | H85312.5<br>0017791            | 44.0                 | 105.0                | 48.0                 | 16.0                 | H8531/2<br>0033050                                                                | 44.0                               | 105.0                | 48.0                 | 15.88                | 5/8                    |                                                                                     |                                                                                     |                                                                                     |
| 13.00<br>33/64<br>13.20<br>17/32                                                                | H85313.0<br>0017906            | 47.0                 | 110.0                | 48.0                 | 16.0                 | H85317/32<br>0033067                                                              | 47.0                               | 110.0                | 48.0                 | 15.88                | 5/8                    |                                                                                     |                                                                                     |                                                                                     |
| 13.50<br>13.60<br>13.70<br>13.80<br>35/64<br>14.00<br>14.10<br>14.20<br>9/16<br>14.50           | H85314.0<br>0017913            | 52.5                 | 116.5                | 48.0                 | 16.0                 | H8539/16<br>0033074                                                               | 52.5                               | 116.5                | 48.0                 | 19.05                | 3/4                    |                                                                                     |                                                                                     |                                                                                     |
| 14.60<br>37/64<br>14.70<br>14.80<br>15.00<br>19/32<br>15.10<br>15.20<br>15.24<br>39/64<br>15.50 | H85315.0<br>0018293            | 55.5                 | 126.5                | 50.0                 | 20.0                 | H85339/64<br>0033081                                                              | 55.5                               | 126.5                | 50.0                 | 19.05                | 3/4                    |                                                                                     |                                                                                     |                                                                                     |

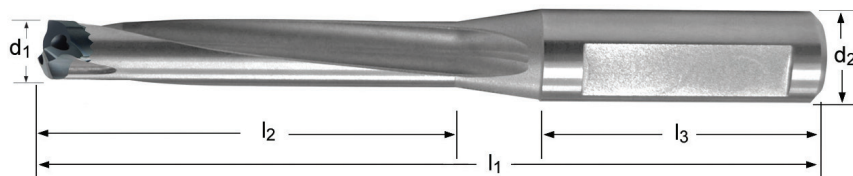
|                                | Hydra Body 3xD<br>Metric Shank |                      |                      |                      |                      |  | Hydra Body 3xD<br>Fractional Shank |                      |                      |                      |                        |  |  |  |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------|----------------------|----------------------|----------------------|----------------------|-----------------------------------------------------------------------------------|------------------------------------|----------------------|----------------------|----------------------|------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| d <sub>1</sub><br>Ø                                                                                             | H853<br>e-Code                 | l <sub>2</sub><br>mm | l <sub>1</sub><br>mm | l <sub>3</sub><br>mm | d <sub>2</sub><br>mm | H853<br>e-Code                                                                    | l <sub>2</sub><br>mm               | l <sub>1</sub><br>mm | l <sub>3</sub><br>mm | d <sub>2</sub><br>mm | d <sub>2</sub><br>inch | H860<br>e-Code                                                                      | H861<br>e-Code                                                                      |                                                                                     |
| 15.60<br>15.70<br>5/8<br>16.00<br>16.08<br>16.10<br>16.20<br>41/64<br>16.30<br>16.50                            | H85316.0<br>0018316            | 59.5                 | 131.5                | 50.0                 | 20.0                 | H85341/64<br>0033098                                                              | 59.5                               | 131.5                | 50.0                 | 19.05                | 3/4                    | H860N2<br>0018842                                                                   | H861N2<br>0018903                                                                   |                                                                                     |
| 16.60<br>21/32<br>16.70<br>17.00<br>43/64<br>17.10<br>17.20<br>11/16<br>17.50                                   |                                |                      |                      |                      |                      |                                                                                   |                                    |                      |                      |                      |                        |                                                                                     |                                                                                     |                                                                                     |
| 17.60<br>17.70<br>45/64<br>18.00<br>18.10<br>18.20<br>23/32<br>18.50                                            |                                |                      |                      |                      |                      |                                                                                   |                                    |                      |                      |                      |                        |                                                                                     |                                                                                     |                                                                                     |
| 18.60<br>47/64<br>18.70<br>18.90<br>19.00<br>3/4<br>19.10<br>19.20<br>19.25<br>19.30<br>19.35<br>49/64<br>19.50 | H85318.0<br>0018330            | 66.5                 | 141.5                | 50.0                 | 20.0                 | H85323/32<br>0033111                                                              | 66.5                               | 141.5                | 50.0                 | 19.05                | 3/4                    |                                                                                     |                                                                                     | H860N3<br>0018859                                                                   |
| 19.60<br>19.70<br>25/32<br>20.00<br>51/64<br>20.50                                                              | H85319.0<br>0018347            | 69.5                 | 156.5                | 56.0                 | 25.0                 | H85349/64<br>0033128                                                              | 69.5                               | 156.5                | 56.0                 | 25.40                | 1"                     |                                                                                     |                                                                                     |                                                                                     |
| 13/16<br>21.00<br>53/64<br>27/32<br>21.50                                                                       | H85320.0<br>0018354            | 73.5                 | 156.5                | 56.0                 | 25.0                 | H85351/64<br>0033135                                                              | 73.5                               | 156.5                | 56.0                 | 25.40                | 1"                     |                                                                                     |                                                                                     |                                                                                     |
| 55/64<br>22.00<br>7/8<br>22.50<br>57/64<br>22.70                                                                | H85321.0<br>0018361            | 76.5                 | 156.5                | 56.0                 | 25.0                 | H85327/32<br>0033142                                                              | 76.5                               | 156.5                | 56.0                 | 25.40                | 1"                     |                                                                                     |                                                                                     |                                                                                     |
| 23.00<br>29/32<br>59/64<br>23.50                                                                                | H85322.0<br>0018378            | 80.1                 | 161.5                | 56.0                 | 25.0                 | H85357/64<br>0033159                                                              | 80.1                               | 161.5                | 56.0                 | 25.40                | 1"                     | H860N4<br>0018866                                                                   |                                                                                     |                                                                                     |
| 15/16<br>24.00<br>61/64<br>24.50<br>31/32                                                                       | H85323.0<br>0018385            | 82.5                 | 160.5                | 56.0                 | 25.0                 | H85359/64<br>0033166                                                              | 82.5                               | 160.5                | 56.0                 | 25.40                | 1"                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                                                 | H85324.0<br>0018392            | 86.2                 | 170.2                | 60.0                 | 32.0                 | H85331/32<br>0033173                                                              | 86.2                               | 170.2                | 60.0                 | 25.40                | 1"                     |                                                                                     |                                                                                     |                                                                                     |

|  | Hydra Body 3xD<br>Metric Shank |                      |                      |                      |                      |  | Hydra Body 3xD<br>Fractional Shank |                      |                      |                      |                        |  |  |  |
|-----------------------------------------------------------------------------------|--------------------------------|----------------------|----------------------|----------------------|----------------------|-----------------------------------------------------------------------------------|------------------------------------|----------------------|----------------------|----------------------|------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| d <sub>1</sub><br>Ø                                                               | H853<br>e-Code                 | l <sub>2</sub><br>mm | l <sub>1</sub><br>mm | l <sub>3</sub><br>mm | d <sub>2</sub><br>mm | H853<br>e-Code                                                                    | l <sub>2</sub><br>mm               | l <sub>1</sub><br>mm | l <sub>3</sub><br>mm | d <sub>2</sub><br>mm | d <sub>2</sub><br>inch | H860<br>e-Code                                                                      | H861<br>e-Code                                                                      |                                                                                     |
| 25.00<br>63/64<br>1"                                                              | H85325.0<br>0018408            | 88.0                 | 170.0                | 60.0                 | 32.0                 | H8531.1/64<br>0033180                                                             | 88.0                               | 170.0                | 60.0                 | 31.75                | 1.1/4                  | H860N5<br>0018873                                                                   | H861N4<br>0018927                                                                   |                                                                                     |
| 25.50<br>25.65<br>1.1/64                                                          |                                |                      |                      |                      |                      |                                                                                   |                                    |                      |                      |                      |                        |                                                                                     |                                                                                     |                                                                                     |
| 26.00<br>1.1/32<br>26.50<br>1.3/64                                                |                                |                      |                      |                      |                      |                                                                                   |                                    |                      |                      |                      |                        |                                                                                     |                                                                                     |                                                                                     |
| 26.00<br>1.1/32<br>26.50<br>1.3/64                                                | H85326.0<br>0018415            | 92.0                 | 175.0                | 60.0                 | 32.0                 | H8531.3/64<br>0033197                                                             | 92.0                               | 175.0                | 60.0                 | 31.75                | 1.1/4                  |                                                                                     |                                                                                     |                                                                                     |
| 1.1/16<br>27.00<br>1.5/64<br>27.50<br>1.3/32                                      | H85327.0<br>0018422            | 94.0                 | 175.0                | 60.0                 | 32.0                 | H8531.3/32<br>0033210                                                             | 94.0                               | 175.0                | 60.0                 | 31.75                | 1.1/4                  |                                                                                     |                                                                                     |                                                                                     |
| 28.00<br>1.7/64<br>28.50<br>1.1/8                                                 | H85328.0<br>0018439            | 97.0                 | 180.0                | 60.0                 | 32.0                 | H8531.1/8<br>0033227                                                              | 97.0                               | 180.0                | 60.0                 | 31.75                | 1.1/4                  | H860N6<br>0018880                                                                   | H861N5<br>0018934                                                                   |                                                                                     |
| 1.9/64<br>29.00<br>1.5/32<br>29.50<br>1.11/64                                     | H85329.0<br>0018446            | 100.0                | 185.0                | 60.0                 | 32.0                 | H8531.11/64<br>0033234                                                            | 100.0                              | 185.0                | 60.0                 | 31.75                | 1.1/4                  |                                                                                     |                                                                                     |                                                                                     |
| 30.00<br>1.3/16<br>30.50                                                          | H85330.0<br>0018453            | 104.0                | 185.0                | 60.0                 | 32.0                 | H8531.3/16<br>0033425                                                             | 104.0                              | 185.0                | 60.0                 | 31.75                | 1.1/4                  |                                                                                     |                                                                                     |                                                                                     |
| 1.7/32<br>31.00<br>1.1/4<br>32.00                                                 | H85332.0<br>46111405           | 111.5                | 196.5                | 60.0                 | 32.0                 | —                                                                                 | —                                  | —                    | —                    | —                    | —                      |                                                                                     |                                                                                     |                                                                                     |
| 32.50<br>1.19/64<br>33.00<br>33.50                                                | H85333.5<br>46111406           | 116.5                | 201.5                | 60.0                 | 40.0                 | —                                                                                 | —                                  | —                    | —                    | —                    | —                      |                                                                                     |                                                                                     |                                                                                     |
| 34.00<br>1.11/32<br>34.50<br>1.3/8<br>35.00                                       | H85335.0<br>46111407           | 121.5                | 216.5                | 70.0                 | 40.0                 | —                                                                                 | —                                  | —                    | —                    | —                    | —                      | H860N7<br>4611949                                                                   | H861N6<br>46260354                                                                  |                                                                                     |
| 36.00<br>1.27/64<br>36.50                                                         | H85336.5<br>46111408           | 125.5                | 221.5                | 70.0                 | 40.0                 | —                                                                                 | —                                  | —                    | —                    | —                    | —                      |                                                                                     |                                                                                     |                                                                                     |
| 37.00<br>1.15/32<br>37.50<br>38.00                                                | H85338.0<br>46111409           | 131.5                | 226.5                | 70.0                 | 40.0                 | —                                                                                 | —                                  | —                    | —                    | —                    | —                      |                                                                                     |                                                                                     |                                                                                     |
| 1.1/2<br>38.50<br>1.17/32<br>39.00<br>39.50                                       | H85339.5<br>46111410           | 136.5                | 231.5                | 70.0                 | 40.0                 | —                                                                                 | —                                  | —                    | —                    | —                    | —                      |                                                                                     |                                                                                     |                                                                                     |
| 1.9/16<br>40.00<br>41.00                                                          | H85341.0<br>46111411           | 146.5                | 246.5                | 70.0                 | 40.0                 | —                                                                                 | —                                  | —                    | —                    | —                    | —                      |                                                                                     |                                                                                     |                                                                                     |
| 1.5/8<br>42.00                                                                    | H85342.5<br>46111412           | 151.6                | 251.6                | 70.0                 | 40.0                 | —                                                                                 | —                                  | —                    | —                    | —                    | —                      |                                                                                     |                                                                                     |                                                                                     |



## H855 • Hydra Body 5 x D

Cylindrical shank with flat for multi-purpose tool holding. Allows accurate clamping for reliable use of internal coolant



Four (4) screws and one (1) screwdriver are included with a drill body

|                | Hydra Body 5xD<br>Metric Shank |                      |                      |                      |                      |  | Hydra Body 5xD<br>Fractional Shank |                      |                      |                      |                        |  |  |  |
|-------------------------------------------------------------------------------------------------|--------------------------------|----------------------|----------------------|----------------------|----------------------|------------------------------------------------------------------------------------|------------------------------------|----------------------|----------------------|----------------------|------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| d <sub>1</sub><br>Ø                                                                             | H855<br>e-Code                 | l <sub>2</sub><br>mm | l <sub>1</sub><br>mm | l <sub>3</sub><br>mm | d <sub>2</sub><br>mm | H855<br>e-Code                                                                     | l <sub>2</sub><br>mm               | l <sub>1</sub><br>mm | l <sub>3</sub><br>mm | d <sub>2</sub><br>mm | d <sub>2</sub><br>inch | H860<br>e-Code                                                                       | H861<br>e-Code                                                                      |                                                                                      |
| 15/32<br>12.00<br>12.10<br>12.20<br>31/64                                                       | H85512.0<br>0018460            | 69.0                 | 130.0                | 48.0                 | 16.0                 | H85531/64<br>0033586                                                               | 69.0                               | 130.0                | 48.0                 | 15.88                | 5/8                    | H860N1<br>0018835                                                                    | H861N1<br>0018897                                                                   |                                                                                      |
| 12.50<br>12.60<br>1/2<br>12.80<br>12.90                                                         | H85512.5<br>0018477            | 69.0                 | 130.0                | 48.0                 | 16.0                 | H8551/2<br>0034095                                                                 | 69.0                               | 130.0                | 48.0                 | 15.88                | 5/8                    |                                                                                      |                                                                                     |                                                                                      |
| 13.00<br>33/64<br>13.20<br>17/32                                                                | H85513.0<br>0018484            | 74.0                 | 140.0                | 48.0                 | 16.0                 | H85517/32<br>0034132                                                               | 74.0                               | 140.0                | 48.0                 | 15.88                | 5/8                    |                                                                                      |                                                                                     |                                                                                      |
| 13.50<br>13.60<br>13.70<br>35/64<br>14.00<br>14.20<br>9/16<br>14.50                             | H85514.0<br>0018491            | 81.5                 | 146.5                | 48.0                 | 16.0                 | H8559/16<br>0034699                                                                | 81.5                               | 146.5                | 48.0                 | 19.05                | 3/4                    |                                                                                      |                                                                                     |                                                                                      |
| 14.60<br>37/64<br>14.70<br>14.80<br>15.00<br>19/32<br>15.10<br>15.20<br>15.24<br>39/64<br>15.50 | H85515.0<br>0018507            | 86.5                 | 156.5                | 50.0                 | 20.0                 | H85539/64<br>0034705                                                               | 86.5                               | 156.5                | 50.0                 | 19.05                | 3/4                    |                                                                                      |                                                                                     |                                                                                      |

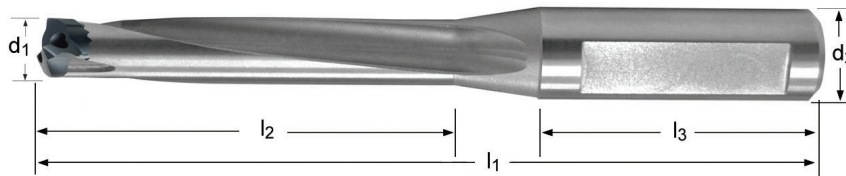
|                                | Hydra Body 5xD<br>Metric Shank    |                      |                      |                      |                      |  | Hydra Body 5xD<br>Fractional Shank |                      |                      |                      |                      |  |  |  |
|-----------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------|----------------------|----------------------|----------------------|-----------------------------------------------------------------------------------|------------------------------------|----------------------|----------------------|----------------------|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| d <sub>1</sub><br>Ø                                                                                             | H855<br>e-Code                    | l <sub>2</sub><br>mm | l <sub>1</sub><br>mm | l <sub>3</sub><br>mm | d <sub>2</sub><br>mm |                                                                                   | H855<br>e-Code                     | l <sub>2</sub><br>mm | l <sub>1</sub><br>mm | l <sub>3</sub><br>mm | d <sub>2</sub><br>mm | d <sub>2</sub><br>inch                                                              | H860<br>e-Code                                                                      | H861<br>e-Code                                                                      |
| 15.60<br>15.70<br>5/8<br>16.00<br>16.08<br>16.10<br>16.20<br>41/64<br>16.30<br>16.50                            | <b>H85516.0</b><br><b>0018514</b> | 92.5                 | 166.5                | 50.0                 | 20.0                 |                                                                                   | <b>H85541/64</b><br><b>0034712</b> | 92.5                 | 166.5                | 50.0                 | 19.05                | 3/4                                                                                 | <b>H860N2</b><br><b>0018842</b>                                                     | <b>H861N2</b><br><b>0018903</b>                                                     |
| 16.60<br>21/32<br>16.70<br>17.00<br>43/64<br>17.10<br>17.20<br>11/16<br>17.50                                   |                                   |                      |                      |                      |                      |                                                                                   |                                    |                      |                      |                      |                      |                                                                                     |                                                                                     |                                                                                     |
| 17.60<br>17.70<br>45/64<br>18.00<br>18.10<br>18.20<br>23/32<br>18.50                                            |                                   |                      |                      |                      |                      |                                                                                   |                                    |                      |                      |                      |                      |                                                                                     |                                                                                     |                                                                                     |
| 18.60<br>47/64<br>18.70<br>18.90<br>19.00<br>3/4<br>19.10<br>19.20<br>19.25<br>19.30<br>19.35<br>49/64<br>19.50 | <b>H85519.0</b><br><b>0018545</b> | 108.5                | 191.5                | 56.0                 | 20.0                 |                                                                                   | <b>H85549/64</b><br><b>0034798</b> | 108.5                | 191.5                | 56.0                 | 25.40                | 1"                                                                                  | <b>H860N3</b><br><b>0018859</b>                                                     | <b>H861N3</b><br><b>0018910</b>                                                     |
| 19.60<br>19.70<br>25/32<br>20.00<br>51/64<br>20.50                                                              |                                   |                      |                      |                      |                      |                                                                                   |                                    |                      |                      |                      |                      |                                                                                     |                                                                                     |                                                                                     |
| 13/16<br>21.00<br>53/64<br>27/32<br>21.50                                                                       |                                   |                      |                      |                      |                      |                                                                                   |                                    |                      |                      |                      |                      |                                                                                     |                                                                                     |                                                                                     |
| 55/64<br>22.00<br>7/8<br>22.50<br>57/64<br>22.70                                                                | <b>H85522.0</b><br><b>0018576</b> | 125.1                | 201.1                | 56.0                 | 25.0                 |                                                                                   | <b>H85557/64</b><br><b>0034835</b> | 125.1                | 201.1                | 56.0                 | 25.40                | 1"                                                                                  | <b>H860N4</b><br><b>0018866</b>                                                     |                                                                                     |
| 23.00<br>29/32<br>59/64<br>23.50                                                                                |                                   |                      |                      |                      |                      |                                                                                   |                                    |                      |                      |                      |                      |                                                                                     |                                                                                     |                                                                                     |
| 15/16<br>24.00<br>61/64<br>24.50<br>31/32                                                                       |                                   |                      |                      |                      |                      |                                                                                   |                                    |                      |                      |                      |                      |                                                                                     |                                                                                     |                                                                                     |
|                                                                                                                 | <b>H85523.0</b><br><b>0018583</b> | 129.5                | 210.5                | 56.0                 | 25.0                 |                                                                                   | <b>H85559/64</b><br><b>0034842</b> | 129.5                | 210.5                | 56.0                 | 25.40                | 1"                                                                                  |                                                                                     |                                                                                     |
|                                                                                                                 | <b>H85524.0</b><br><b>0018590</b> | 135.2                | 220.2                | 60.0                 | 32.0                 |                                                                                   | <b>H85531/32</b><br><b>0034859</b> | 135.2                | 220.2                | 60.0                 | 25.40                | 1"                                                                                  |                                                                                     |                                                                                     |

|  | Hydra Body 5xD<br>Metric Shank |                      |                      |                      |                      |  | Hydra Body 5xD<br>Fractional Shank |                      |                      |                      |                      |  |  |  |
|-----------------------------------------------------------------------------------|--------------------------------|----------------------|----------------------|----------------------|----------------------|-----------------------------------------------------------------------------------|------------------------------------|----------------------|----------------------|----------------------|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| d <sub>1</sub><br>Ø                                                               | H855<br>e-Code                 | l <sub>2</sub><br>mm | l <sub>1</sub><br>mm | l <sub>3</sub><br>mm | d <sub>2</sub><br>mm |                                                                                   | H855<br>e-Code                     | l <sub>2</sub><br>mm | l <sub>1</sub><br>mm | l <sub>3</sub><br>mm | d <sub>2</sub><br>mm | d <sub>2</sub><br>inch                                                              | H860<br>e-Code                                                                      | H861<br>e-Code                                                                      |
| 25.00<br>63/64<br>1"                                                              | H85525.0<br>0018606            | 140.0                | 225.0                | 60.0                 | 32.0                 |                                                                                   | H8551.1/64<br>0034866              | 140.0                | 225.0                | 60.0                 | 31.75                | 1.1/4                                                                               | H860N5<br>0018873                                                                   | H861N4<br>0018927                                                                   |
| 25.50                                                                             |                                |                      |                      |                      |                      |                                                                                   |                                    |                      |                      |                      |                      |                                                                                     |                                                                                     |                                                                                     |
| 25.65<br>1.1/64                                                                   |                                |                      |                      |                      |                      |                                                                                   |                                    |                      |                      |                      |                      |                                                                                     |                                                                                     |                                                                                     |
| 26.00<br>1.1/32                                                                   | H85526.0<br>0018613            | 146.0                | 230.0                | 60.0                 | 32.0                 |                                                                                   | H8551.3/64<br>0034873              | 146.0                | 230.0                | 60.0                 | 31.75                | 1.1/4                                                                               | H860N5<br>0018873                                                                   | H861N4<br>0018927                                                                   |
| 26.50<br>1.3/64                                                                   |                                |                      |                      |                      |                      |                                                                                   |                                    |                      |                      |                      |                      |                                                                                     |                                                                                     |                                                                                     |
| 1.1/16<br>27.00<br>1.5/64<br>27.50<br>1.3/32                                      | H85527.0<br>0018620            | 151.0                | 235.0                | 60.0                 | 32.0                 |                                                                                   | H8551.3/32<br>0034897              | 151.0                | 235.0                | 60.0                 | 31.75                | 1.1/4                                                                               |                                                                                     |                                                                                     |
| 28.00<br>1.7/64<br>28.50<br>1.1/8                                                 | H85528.0<br>0018637            | 157.0                | 240.0                | 60.0                 | 32.0                 |                                                                                   | H8551.1/8<br>0034903               | 157.0                | 240.0                | 60.0                 | 31.75                | 1.1/4                                                                               | H860N6<br>0018880                                                                   | H861N5<br>0018934                                                                   |
| 1.9/64<br>29.00<br>1.5/32<br>29.50<br>1.11/64                                     | H85529.0<br>0018644            | 162.0                | 245.0                | 60.0                 | 32.0                 |                                                                                   | H8551.11/64<br>0034934             | 162.0                | 245.0                | 60.0                 | 31.75                | 1.1/4                                                                               |                                                                                     |                                                                                     |
| 30.00<br>1.3/16<br>30.50                                                          | H85530.0<br>0018651            | 167.0                | 255.0                | 60.0                 | 32.0                 |                                                                                   | H8551.3/16<br>0034965              | 167.0                | 225.0                | 60.0                 | 31.75                | 1.1/4                                                                               |                                                                                     |                                                                                     |
| 1.7/32<br>31.00<br>1.1/4<br>32.00                                                 | H85532.0<br>46111413           | 176.5                | 261.5                | 60.0                 | 32.0                 |                                                                                   | —                                  | —                    | —                    | —                    | —                    | —                                                                                   |                                                                                     |                                                                                     |
| 32.50<br>1.19/64<br>33.00<br>33.50                                                | H85533.5<br>46111414           | 186.5                | 271.5                | 60.0                 | 40.0                 |                                                                                   | —                                  | —                    | —                    | —                    | —                    | —                                                                                   |                                                                                     |                                                                                     |
| 34.00<br>1.11/32<br>34.50<br>1.3/8<br>35.00                                       | H85535.0<br>46111415           | 196.5                | 291.5                | 70.0                 | 40.0                 |                                                                                   | —                                  | —                    | —                    | —                    | —                    | —                                                                                   | H860N7<br>46111949                                                                  | H861N6<br>46260354                                                                  |
| 36.00<br>1.27/64<br>36.50                                                         | H85536.5<br>46111416           | 201.5                | 296.5                | 70.0                 | 40.0                 |                                                                                   | —                                  | —                    | —                    | —                    | —                    | —                                                                                   |                                                                                     |                                                                                     |
| 37.00<br>1.15/32<br>37.50<br>38.00                                                | H85538.0<br>46111417           | 211.5                | 306.5                | 70.0                 | 40.0                 |                                                                                   | —                                  | —                    | —                    | —                    | —                    | —                                                                                   |                                                                                     |                                                                                     |
| 1.1/2<br>38.50<br>1.17/32<br>39.00<br>39.50                                       | H85539.5<br>46111418           | 211.5                | 316.5                | 70.0                 | 40.0                 |                                                                                   | —                                  | —                    | —                    | —                    | —                    | —                                                                                   |                                                                                     |                                                                                     |
| 1.9/16<br>40.00<br>41.00                                                          | H85541.0<br>46111419           | 226.5                | 325.6                | 70.0                 | 40.0                 |                                                                                   | —                                  | —                    | —                    | —                    | —                    | —                                                                                   |                                                                                     |                                                                                     |
| 1.5/8<br>42.00                                                                    | H85542.5<br>46111420           | 236.5                | 336.5                | 70.0                 | 40.0                 |                                                                                   | —                                  | —                    | —                    | —                    | —                    | —                                                                                   |                                                                                     |                                                                                     |



## H858 • Hydra Body 8 x D

Cylindrical shank with flat for multi-purpose tool holding. Allows accurate clamping for reliable use of internal coolant.



Four (4) screws and one (1) screwdriver are included with a drill body

|              | Hydra Body 8xD<br>Metric Shank    |             |             |             |             |  |  |
|-------------------------------------------------------------------------------------------------|-----------------------------------|-------------|-------------|-------------|-------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| $d_1$<br>Ø                                                                                      | H858<br>e-Code                    | $l_2$<br>mm | $l_1$<br>mm | $l_3$<br>mm | $d_2$<br>mm | H860<br>e-Code                                                                       | H861<br>e-Code                                                                        |
| 13.50<br>13.60<br>13.70<br>13.80<br>35/64<br>14.00<br>14.10<br>14.20<br>9/16<br>14.50           | <b>H85814.0</b><br><b>0018668</b> | 124.5       | 191.5       | 48.0        | 16.0        | <b>H860N1</b><br><b>0018835</b>                                                      | <b>H861N1</b><br><b>0018897</b>                                                       |
| 14.60<br>37/64<br>14.70<br>14.80<br>15.00<br>19/32<br>15.10<br>15.20<br>15.24<br>39/64<br>15.50 |                                   |             |             |             |             |                                                                                      |                                                                                       |
|                                                                                                 | <b>H85815.0</b><br><b>0018675</b> | 133.5       | 201.5       | 50.0        | 20.0        |                                                                                      |                                                                                       |



|                                | Hydra Body 8xD<br>Metric Shank |                      |                      |                      |                      |  |  |  |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------|----------------------|----------------------|----------------------|----------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| d <sub>1</sub><br>Ø                                                                                             | H858<br>e-Code                 | l <sub>2</sub><br>mm | l <sub>1</sub><br>mm | l <sub>3</sub><br>mm | d <sub>2</sub><br>mm | H860<br>e-Code                                                                    | H861<br>e-Code                                                                      |                                                                                     |
| 15.60<br>15.70<br>5/8<br>16.00<br>16.08<br>16.10<br>16.20<br>41/64<br>16.30<br>16.50                            | H85816.0<br>0018682            | 141.5                | 211.5                | 50.0                 | 20.0                 | H860N2<br>0018842                                                                 | H861N2<br>0018903                                                                   |                                                                                     |
| 16.60<br>21/32<br>16.70<br>17.00<br>43/64<br>17.10<br>17.20<br>11/16<br>17.50                                   |                                |                      |                      |                      |                      |                                                                                   |                                                                                     |                                                                                     |
| 17.60<br>17.70<br>45/64<br>18.00<br>18.10<br>18.20<br>23/32<br>18.50                                            |                                |                      |                      |                      |                      |                                                                                   |                                                                                     |                                                                                     |
| 18.60<br>47/64<br>18.70<br>18.90<br>19.00<br>3/4<br>19.10<br>19.20<br>19.25<br>19.30<br>19.35<br>49/64<br>19.50 | H85818.0<br>0018705            | 158.5                | 226.5                | 50.0                 | 20.0                 | H860N3<br>0018859                                                                 | H861N3<br>0018910                                                                   |                                                                                     |
| 18.60<br>47/64<br>18.70<br>18.90<br>19.00<br>3/4<br>19.10<br>19.20<br>19.25<br>19.30<br>19.35<br>49/64<br>19.50 | H85819.0<br>0018712            | 167.5                | 251.5                | 56.0                 | 25.0                 |                                                                                   |                                                                                     |                                                                                     |
| 19.60<br>19.70<br>25/32<br>20.00<br>51/64<br>20.50                                                              | H85820.0<br>0018729            | 175.5                | 264.5                | 56.0                 | 25.0                 |                                                                                   |                                                                                     |                                                                                     |
| 13/16<br>21.00<br>53/64<br>27/32<br>21.50                                                                       | H85821.0<br>0018736            | 184.5                | 266.5                | 56.0                 | 25.0                 | H860N4<br>0018866                                                                 |                                                                                     |                                                                                     |
| 55/64<br>22.00<br>7/8<br>22.50<br>57/64<br>22.70                                                                | H85822.0<br>0018743            | 192.1                | 271.1                | 56.0                 | 25.0                 |                                                                                   |                                                                                     |                                                                                     |
| 23.00<br>29/32<br>59/64<br>23.50                                                                                | H85823.0<br>0018750            | 200.5                | 280.5                | 56.0                 | 25.0                 |                                                                                   |                                                                                     |                                                                                     |
| 15/16<br>24.00<br>61/64<br>24.50<br>31/32                                                                       | H85824.0<br>0018767            | 208.2                | 295.2                | 60.0                 | 32.0                 |                                                                                   |                                                                                     |                                                                                     |

|  | Hydra Body 8xD<br>Metric Shank |                      |                      |                      |                      |  |  |  |
|-----------------------------------------------------------------------------------|--------------------------------|----------------------|----------------------|----------------------|----------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| d <sub>1</sub><br>Ø                                                               | H858<br>e-Code                 | l <sub>2</sub><br>mm | l <sub>1</sub><br>mm | l <sub>3</sub><br>mm | d <sub>2</sub><br>mm | H860<br>e-Code                                                                    | H861<br>e-Code                                                                     |                                                                                     |
| 25.00<br>63/64<br>1"                                                              | H85825.0<br>0018774            | 217.0                | 300.0                | 60.0                 | 32.0                 | H860N5<br>0018873                                                                 | H861N4<br>0018927                                                                  |                                                                                     |
| 25.50<br>25.65<br>1.1/64                                                          |                                |                      |                      |                      |                      |                                                                                   |                                                                                    |                                                                                     |
| 26.00<br>1.1/32<br>26.50<br>1.3/64                                                |                                |                      |                      |                      |                      |                                                                                   |                                                                                    |                                                                                     |
| 26.00<br>1.1/32<br>26.50<br>1.3/64                                                | H85826.0<br>0018781            | 225.0                | 310.0                | 60.0                 | 32.0                 |                                                                                   |                                                                                    |                                                                                     |
| 26.00<br>1.1/32<br>26.50<br>1.3/64                                                | H85827.0<br>0018798            | 234.0                | 320.0                | 60.0                 | 32.0                 |                                                                                   |                                                                                    |                                                                                     |
| 27.00<br>1.5/64<br>27.50<br>1.3/32                                                |                                |                      |                      |                      |                      |                                                                                   |                                                                                    |                                                                                     |
| 28.00<br>1.7/64<br>28.50<br>1.1/8                                                 |                                |                      |                      |                      |                      |                                                                                   |                                                                                    |                                                                                     |
| 27.00<br>1.5/64<br>27.50<br>1.3/32                                                | H85828.0<br>0018804            | 242.0                | 325.0                | 60.0                 | 32.00                | H860N6<br>0018880                                                                 | H861N5<br>0018934                                                                  |                                                                                     |
| 28.00<br>1.7/64<br>28.50<br>1.1/8                                                 | H85829.0<br>0018811            | 251.0                | 335.0                | 60.0                 | 32.0                 |                                                                                   |                                                                                    |                                                                                     |
| 29.00<br>1.5/32<br>29.50<br>1.11/64                                               |                                |                      |                      |                      |                      |                                                                                   |                                                                                    |                                                                                     |
| 30.00<br>1.3/16<br>30.50                                                          |                                |                      |                      |                      |                      |                                                                                   |                                                                                    |                                                                                     |
| 29.00<br>1.5/32<br>29.50<br>1.11/64                                               | H85830.0<br>0018828            | 259.0                | 345.0                | 60.0                 | 32.0                 |                                                                                   |                                                                                    |                                                                                     |
| 30.00<br>1.3/16<br>30.50                                                          | H85832.0<br>46111421           | 271.5                | 356.5                | 60.0                 | 32.0                 | H860N7<br>46111949                                                                | H861N6<br>46260354                                                                 |                                                                                     |
| 31.00<br>1.1/4<br>32.00                                                           |                                |                      |                      |                      |                      |                                                                                   |                                                                                    |                                                                                     |
| 32.00<br>1.1/4<br>32.00                                                           |                                |                      |                      |                      |                      |                                                                                   |                                                                                    |                                                                                     |
| 32.50<br>1.19/64<br>33.00<br>33.50                                                | H85833.5<br>46111422           | 286.5                | 371.5                | 60.0                 | 40.0                 |                                                                                   |                                                                                    |                                                                                     |
| 32.50<br>1.19/64<br>33.00<br>33.50                                                | H85835.0<br>46111423           | 301.5                | 396.5                | 70.0                 | 40.0                 |                                                                                   |                                                                                    |                                                                                     |
| 34.00<br>1.1/32<br>34.50<br>1.3/8<br>35.00                                        |                                |                      |                      |                      |                      |                                                                                   |                                                                                    |                                                                                     |
| 36.00<br>1.27/64<br>36.50                                                         |                                |                      |                      |                      |                      |                                                                                   |                                                                                    |                                                                                     |
| 34.00<br>1.1/32<br>34.50<br>1.3/8<br>35.00                                        | H85836.5<br>46111424           | 311.5                | 406.5                | 70.0                 | 40.0                 |                                                                                   |                                                                                    |                                                                                     |
| 36.00<br>1.27/64<br>36.50                                                         | H85838.0<br>46111425           | 326.5                | 421.5                | 70.0                 | 40.0                 | H860N7<br>46111949                                                                | H861N6<br>46260354                                                                 |                                                                                     |
| 37.00<br>1.15/32<br>37.50<br>38.00                                                |                                |                      |                      |                      |                      |                                                                                   |                                                                                    |                                                                                     |
| 38.00<br>1.15/32<br>37.50<br>38.00                                                |                                |                      |                      |                      |                      |                                                                                   |                                                                                    |                                                                                     |
| 37.00<br>1.15/32<br>37.50<br>38.00                                                | H85839.5<br>46111426           | 336.5                | 431.5                | 70.0                 | 40.0                 |                                                                                   |                                                                                    |                                                                                     |
| 38.00<br>1.17/32<br>39.00<br>39.50                                                |                                |                      |                      |                      |                      |                                                                                   |                                                                                    |                                                                                     |
| 39.00<br>1.17/32<br>39.00<br>39.50                                                |                                |                      |                      |                      |                      |                                                                                   |                                                                                    |                                                                                     |
| 39.00<br>1.17/32<br>39.00<br>39.50                                                | H85841.0<br>46111427           | 351.5                | 451.5                | 70.0                 | 40.0                 | H860N7<br>46111949                                                                | H861N6<br>46260354                                                                 |                                                                                     |
| 40.00<br>1.9/16<br>41.00                                                          |                                |                      |                      |                      |                      |                                                                                   |                                                                                    |                                                                                     |
| 41.00<br>1.9/16<br>40.00<br>41.00                                                 |                                |                      |                      |                      |                      |                                                                                   |                                                                                    |                                                                                     |
| 41.00<br>1.9/16<br>40.00<br>41.00                                                 | H85842.5<br>46111428           | 361.5                | 461.5                | 70.0                 | 40.0                 |                                                                                   |                                                                                    |                                                                                     |
| 42.00<br>1.5/8<br>42.00                                                           |                                |                      |                      |                      |                      |                                                                                   |                                                                                    |                                                                                     |

# Drilling Hints & Tips with the *Hydra Drill*

## COOLANTS

For maximum chip evacuation and tool performance, coolant use is recommended.

Emulsion coolant concentration of 6 – 8% is recommended for most applications, at a coolant pressure of 20 bar or higher. For high strength steel, stainless steels and tougher drilling applications, use a higher concentration of 10-12%. In these applications, particularly in stainless steels, it is recommended to use the maximum coolant pressure on the machine.

The Hydra-drill coolant holes provide improved web strength and reduce heat at the cutting edges for increased productivity and longer tool life.

## HOLDERS

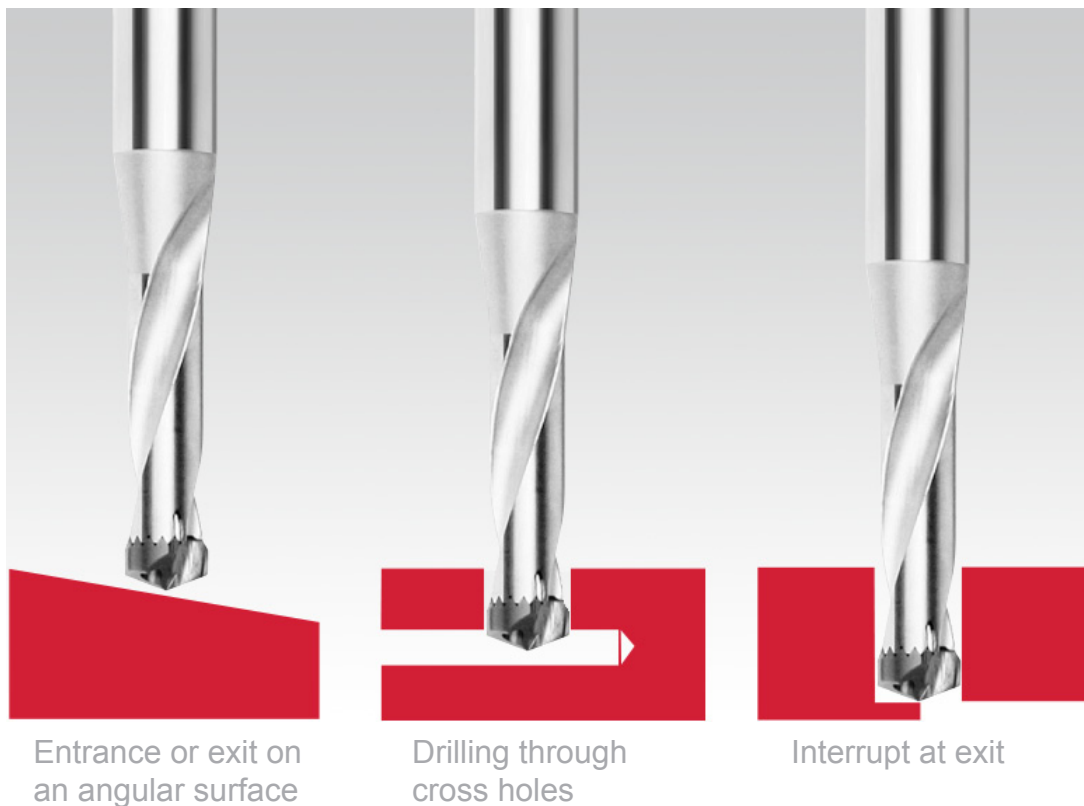
Always use tool holders and collets that provide good concentricity between the drill and the machine spindle. Use a positive stop to prevent the tool from backing up into the holder. Radial runout in the tool assembly must be accurately checked and maintained.

## WORKPIECE

A secure and rigid workpiece will minimise deflection, and allow for better accuracy and true position of the hole.

## FEEDS

It is important not to underfeed the drill which will cause it to dwell and dull. This is particularly true in work hardening materials. Feed rates should be high enough for proper chip formation.



In these drilling scenarios, reducing feed rate to 1/3 (33%) is generally recommended. Drilling into an entry angle of more than 10° is NOT recommended – surface should be milled flat first.





**Dormer Tools**  
Morse Way  
Waverley  
Sheffield  
S60 5BJ  
**United Kingdom**  
T: 0870 850 44 66  
F: 0870 850 88 66  
Email: [dormer.uk@dormertools.com](mailto:dormer.uk@dormertools.com)

**Dormer Tools International**  
Morse Way  
Waverley  
Sheffield  
S60 5BJ  
**United Kingdom**  
T: +44 114 2933838  
F: +44 114 2933839  
Email: [dormer.int@dormertools.com](mailto:dormer.int@dormertools.com)  
responsible for  
Middle East  
**Far East**

**Dormer Tools**  
B.P. 6209  
45062 Orleans Cedex 2  
**France - France**  
T: +33 (0)2 38 41 40 15  
F: +33 (0)2 38 41 40 30  
Email: [dormer.fr@dormertools.com](mailto:dormer.fr@dormertools.com)

**Dormer Tools**  
's-Gravelandsweg 401  
NL-3125 BJ Schiedam  
**Netherlands - Nederland**  
T: +31 10 2080 240  
F: +31 10 2080 282  
Email: [dormer.nl@dormertools.com](mailto:dormer.nl@dormertools.com)

**Dormer Tools CEE**  
Sandvik in Austria GmbH  
Postfach 90  
AT-1211 Wien  
Street address:  
Scheydgasse 44  
AT-1211 Wien  
**Austria - Österreich**  
T: +43 1 277 37 202  
F: +43 1 277 37 203  
Email: [dormer.cee@dormertools.com](mailto:dormer.cee@dormertools.com)

responsible for  
**Austria**  
**Österreich**  
**Belarus**  
**Беларусь**  
**Bulgaria**  
**България**  
**Croatia**  
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**Россия**  
**Serbia**  
**Србија**  
**Slovakia**  
**Slovensko**  
**Slovenia**  
**Slovenija**

**Dormer Tools Central and Eastern Europe**  
Sandvik Slovakia s.r.o.  
Hrančona 18  
SK-82105 Bratislava  
**Slovakia - Slovensko**  
T: +421 2 5831 8206  
F: +421 2 5341 3233  
Email: [dormer.cee@dormertools.com](mailto:dormer.cee@dormertools.com)  
**Dormer Tools Central and Eastern Europe**  
LLC Sandvik Russia  
Ul. Polkovaia 1  
RU- 127018 Moscow  
**Russia - Россия**  
T: +7 495 689 34 25  
F: +7 495 689 34 25  
Email: [dormer.cee@dormertools.com](mailto:dormer.cee@dormertools.com)

**Dormer Tools**  
Via Varesina 184  
20156 Milano  
**Italy - Italia**  
T: +39 02 38 04 51  
F: +39 02 38 04 52 43  
Email: [dormer.it@dormertools.com](mailto:dormer.it@dormertools.com)

**Sandvik Española, S.A.**  
Dormer Tools Ibérica  
Parque Empresarial Puerta de Madrid Este  
C/ Tapiceros, 9  
ES-28830 San Fernando de Henares, Madrid  
T: +34 91 660 51 17(ES)  
F: +34 91 660 51 35 (ES)  
Email: [dormer.es@dormertools.com](mailto:dormer.es@dormertools.com)  
**Spain - España**  
T: +351 21 424 54 21 (PT)  
F: +351 21 424 54 25 (PT)  
Email: [dormer.pt@dormertools.com](mailto:dormer.pt@dormertools.com)  
Responsible for  
**Spain**  
**España**  
**Portugal**  
**Portugal**

**Dormer Tools**  
Sandvik AG  
Bereich Dormer  
Alpenquai 14, Postfach 3869  
6002 Luzern  
**Switzerland**  
T: +41 (0)41 368 33 66  
F: +41 (0)41 368 33 75  
Email: [dormer.int@dormertools.com](mailto:dormer.int@dormertools.com)

**Dormer Tools**  
Fountain Plaza  
Belgicestraat 5, bus 5/6  
BE-1930 Zaventem  
**Belgium - België/Belgique**  
T: +32 3 440 59 01  
F: +32 3 449 15 43  
Email: [dormer.be@dormertools.com](mailto:dormer.be@dormertools.com)

**Dormer Tools**  
Sandvik Tooling Deutschland GmbH  
Geschäftsbereich Dormer  
Heerdter Landstrasse 243  
D-40549 Düsseldorf  
Postfach 10 21 62  
D-40012 Düsseldorf  
**Germany - Deutschland**  
T: +49 211 50 27 0  
F: +49 211 50 27 504  
Email: [dormer.de@dormertools.com](mailto:dormer.de@dormertools.com)

**Dormer Tools**  
Box 618  
SE-301 16 Halmstad  
**Sweden - Sverige**  
T: +46 (0) 35 16 52 00  
F: +46 (0) 35 16 52 90  
Email: [dormer.se@dormertools.com](mailto:dormer.se@dormertools.com)  
Kundservice  
T: direkt +46 35 16 52 96  
F: direkt +46 35 16 52 90

**Dormer Tools**  
PL 52  
FI-01511 Vantaa  
**Finland - Suomi**  
T: +358 205 44 121  
F: +358 205 44 5199  
Customer Service  
T: direkt 0205 44 7003  
F: direkt 0205 44 7004  
Email: [dormer.fi@dormertools.com](mailto:dormer.fi@dormertools.com)

**Dormer Tools**  
Sandvik A/S  
Boks 173  
NO-1377 Billingstad  
**Norway - Norge**  
T: +47 67 17 56 00  
F: +47 66 85 96 10  
E-mail: [dormer.no@dormertools.com](mailto:dormer.no@dormertools.com)  
Kundeservice  
T: direkt 800 10 113  
F: direkt +46 35 16 52 90

**Dormer Tools**  
Sandvik A/S  
Postboks 160  
DK-2605 Brøndby  
**Denmark - Danmark**  
T: +45 43 46 52 80  
F: +45 43 46 52 81  
Email: [dormer.dk@dormertools.com](mailto:dormer.dk@dormertools.com)  
Kundtjeneste  
T: direkt 808 82106  
F: direkt +46 35 16 52 90

**Dormer Tools**  
Av. João Paulo da Silva, 258  
CEP 04777 020  
São Paulo SP  
**Brazil - Brasil**  
T: +55 11 5660 3000  
F: +55 11 5667 5883  
Email: [dormer.br@dormertools.com](mailto:dormer.br@dormertools.com)

**Precision Dormer**  
2550 Meadowvale Blvd. Unit 3  
Mississauga, ON L5N 8C2  
**Canada**  
T: (888) 336 7637  
En Français: (888) 368 8457  
F: (905) 542 7000  
Email: [dormertools.canada@precisiondormer.com](mailto:dormertools.canada@precisiondormer.com)

**Precision Dormer**  
301 Industrial Ave.  
Crystal Lake, IL 60012  
**United States of America**  
T: (800) 877 3745  
F: 815 459 2804  
Email: [cs@precisiondormer.com](mailto:cs@precisiondormer.com)  
responsible for  
**United States of America**  
**Mexico**

**Dormer Tools**  
5 Fowler Road  
Dandenong 3175, Victoria  
**Australia**  
T: 1300 131 274  
F: +61 3 9238 7105  
Email: [dormer.int@dormertools.com](mailto:dormer.int@dormertools.com)

**Dormer Tools**  
Sandvik New Zealand  
269 Ti Rakau Drive  
Burswood  
Manukau 2013  
**New Zealand**  
T: 0800 4 436 763  
F: +64 9 2735857  
Email: [dormer.int@dormertools.com](mailto:dormer.int@dormertools.com)

**Dormer Tools**  
No 4555 Yin Du Road  
Xin Zhuang Industry Park  
Shanghai 201108  
**China**  
T: +86 21 2416 0666  
F: +86 21 5442 6315  
Email: [dormer.cn@dormertools.com](mailto:dormer.cn@dormertools.com)

**Dormer Tools**  
Sandvik Asia Ltd  
Mumbai-Pune Road  
Pune 411 012  
**India**  
T: +91 20 27 10 47 00  
F: +91 20 27 14 57 36  
Email: [dormer.int@dormertools.com](mailto:dormer.int@dormertools.com)

**Dormer Tools**  
Sandvik  
P.O. Box 25038  
East Rand 1462  
**South Africa**  
T: +27 11 929 5300  
F: +27 11 570 9709  
Email: [dormer.int@dormertools.com](mailto:dormer.int@dormertools.com)

**Dormer Tools**  
Sandvik Argentina S.A.  
Rincón 3198  
CP B1754BIL  
San Justo - Buenos Aires  
**Argentina**  
T: 54 (11) 6777-6777  
F: 54 (11) 4441-4467  
Email: [dormer.int@dormertools.com](mailto:dormer.int@dormertools.com)

**Dormer Tools**  
Sandvik Chile S.A.  
Avda. Presidente Edo.  
Frei Montalva 9990  
Quilicura Santiago  
**Chile**  
T: 56 2 6760313  
F: 56 2 7385574  
Email: [dormer.int@dormertools.com](mailto:dormer.int@dormertools.com)



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[www.precisiondormer.com](http://www.precisiondormer.com)