





# Performance tables for type G TU W

max. voltage (U<sub>N</sub>): 250 V

| G TU W  |                      | 040   |       |       |      |      | 050   |       |      |      |      | 060               |      |      |      |      |
|---|----------------------|-------|-------|-------|------|------|-------|-------|------|------|------|-------------------|------|------|------|------|
| Duty rating ED (%)                                  |                      | 100   | 40    | 25    | 15   | 5    | 100   | 40    | 25   | 15   | 5    | 100               | 40   | 25   | 15   | 5    |
| Stroke s (mm)                                       |                      | 8     |       |       |      |      | 10    |       |      |      |      | 12                |      |      |      |      |
| Holding force (N)                                   |                      | 47    | 83    | 103   | 128  | 190  | 117   | 183   | 204  | 262  | 350  | 200               | 300  | 365  | 410  | 595  |
| Magnetic force F <sub>M</sub> (fig. 2) (N)          |                      | 12,4  | 21    | 26    | 31,5 | 54,5 | 20,4  | 35    | 41   | 57   | 97   | 45,5              | 67   | 82   | 96   | 162  |
| Work rating A <sub>N</sub> (Ncm)                    |                      | 9,9   | 16,8  | 20,8  | 25,2 | 43,6 | 20,4  | 35    | 41   | 57   | 97   | 54,6              | 80,4 | 98   | 115  | 194  |
| Power consumption P <sub>20</sub> (W)               |                      | 16,5  | 41    | 66    | 98   | 262  | 21,2  | 53    | 60   | 144  | 335  | 35                | 77   | 106  | 148  | 550  |
| Frequency of oper. (S <sub>n</sub> max.) (1/h)      |                      | 30000 | 16000 | 10000 | 6000 | 2000 | 27000 | 13000 | 8000 | 5000 | 1900 | 19000             | 9500 | 6000 | 4000 | 1600 |
| Closing time t <sub>1</sub> (ms)                    |                      | 120   | 85    | 75    | 70   | 70   | 130   | 110   | 106  | 100  | 91   | 185               | 145  | 140  | 126  | 108  |
| Opening time t <sub>2</sub> (ms)                    |                      | 120   | 85    | 75    | 70   | 70   | 130   | 110   | 106  | 100  | 91   | 185               | 145  | 140  | 126  | 108  |
| Induc-tance<br>L = τ · R<br>(τ · 10 <sup>-3</sup> ) | Time constant τ (ms) |       |       |       |      |      |       |       |      |      |      |                   |      |      |      |      |
|   | Armature open        | 7     |       |       |      |      | 11    |       |      |      |      | 15                |      |      |      |      |
|   | Position closed      | 5     |       |       |      |      | 9     |       |      |      |      | 13                |      |      |      |      |
| Armature weight m <sub>A</sub> (kg)                 |                      | 0,13  |       |       |      |      | 0,2   |       |      |      |      | 0,35              |      |      |      |      |
| Solenoid weight m <sub>M</sub> (kg)                 |                      | 0,75  |       |       |      |      | 1,3   |       |      |      |      | 2,25              |      |      |      |      |
| G TU W  |                      | 070   |       |       |      |      | 080   |       |      |      |      | 090 <sup>1)</sup> |      |      |      |      |
| Duty rating ED (%)                                  |                      | 100   | 40    | 25    | 15   | 5    | 100   | 40    | 25   | 15   | 5    | 100               | 40   | 25   | 15   | 5    |
| Stroke s (mm)                                       |                      | 15    |       |       |      |      | 20    |       |      |      |      | 25                |      |      |      |      |
| Holding force (N)                                   |                      | 236   | 450   | 485   | 580  | 765  | 340   | 535   | 630  | 725  | 850  | 307               | 520  | 630  | 765  | 1080 |
| Magnetic force F <sub>M</sub> (fig. 2) (N)          |                      | 52    | 84    | 105   | 130  | 195  | 55    | 87    | 110  | 135  | 194  | 73,5              | 124  | 145  | 173  | 276  |
| Work rating A <sub>N</sub> (Ncm)                    |                      | 78    | 126   | 158   | 195  | 293  | 110   | 174   | 220  | 270  | 388  | 184               | 310  | 362  | 433  | 690  |
| Power consumption P <sub>20</sub> (W)               |                      | 32,5  | 85    | 142   | 230  | 500  | 45    | 102   | 159  | 250  | 590  | 52                | 131  | 202  | 318  | 824  |
| Frequency of oper. (S <sub>n</sub> max.) (1/h)      |                      | 16000 | 8500  | 5500  | 3600 | 1400 | 14500 | 7500  | 4500 | 3200 | 1300 | 11000             | 5500 | 4000 | 2600 | 1100 |
| Closing time t <sub>1</sub> (ms)                    |                      | 215   | 165   | 160   | 145  | 120  | 240   | 190   | 180  | 160  | 130  | 310               | 240  | 220  | 195  | 155  |
| Opening time t <sub>2</sub> (ms)                    |                      | 215   | 165   | 160   | 145  | 120  | 240   | 190   | 180  | 160  | 130  | 310               | 240  | 220  | 195  | 155  |
| Induc-tance<br>L = τ · R<br>(τ · 10 <sup>-3</sup> ) | Time constant τ (ms) |       |       |       |      |      |       |       |      |      |      |                   |      |      |      |      |
|   | Armature open        | 20    |       |       |      |      | 25    |       |      |      |      | 31                |      |      |      |      |
|   | Position closed      | 18    |       |       |      |      | 23    |       |      |      |      | 30                |      |      |      |      |
| Armature weight m <sub>A</sub> (kg)                 |                      | 0,5   |       |       |      |      | 0,67  |       |      |      |      | 0,8               |      |      |      |      |
| Solenoid weight m <sub>M</sub> (kg)                 |                      | 3,5   |       |       |      |      | 4,7   |       |      |      |      | 7,4               |      |      |      |      |

1) Solenoid sizes ... 100, 120, 140 (100 – 140 mm Ø) available

## PERFORMANCE TABLE

terms are explained in Technical Bulletin G XX & VDE 0580/35.

## TABLE BASIS

24 V/5 – 100 % duty      Ambient temperature 35° C  
 Heat insulated base      Free air mounted  
 Horizontal working      Pull arrangement  
 Tolerance ± 10 % (inherent & manufacture).

## MAGNETIC FORCE (F<sub>M</sub>)

is listed in HOT condition at 90 % of rated voltage (increase approx. 20 % at rated voltage). Adjust for armature weight.

## POWER CONSUMPTION (P<sub>20</sub>)

is listed with a 20° C coil temperature (decrease/HOT).

## DUTY RATING (ED %)

% of energized time per operation cycle:  $\frac{t_{on}}{t_{on} + t_{off}} \times 100$ .

Max. energized time/cycle:

100 % continuous: 40 % – 120 secs., 25 % – 75 secs., 15 % – 45 secs., 5 % – 15 secs.

## OPERATING TIMES (t<sub>1</sub>/t<sub>2</sub>)

are listed per cycle of operation in HOT condition at rated voltage with weight load of 70 % of Force (F<sub>M</sub>) at and over rated stroke.

## ARRANGEMENT

Standard arrangement is for body mounting:

Plug connector      ..43 A 01 (plug Z KB X 311 B 01)  
 Terminal box      ..43 A 02 (D.C.), ...43 A 10/A 12 (A.C., built-in rectifier)  
 Flanges are available for either or both ends.  
 Fork ends available for plungers (list Z GA).

## SUPPLY VOLTAGE:

Standard D.C.: 24 V, 97 V, 195 V, 205 V, 214 V D.C. (max. 250 V) (for rectified 110 V, 220 V, 230 V, 240 V, 50/60-Hz A.C.).  
 May be provided with built-in rectifier (... A 10/A 12), not size 040.

## PROTECTION

Paint (Trop) – Plating/sealed coil (Spec. Trop).

### Conversion Factors

1 N = 0.102 kp ≈ 0.1 kg  
 1 kg = 2.2 lb.  
 1 mm = 0.039 in.  
 1 Ncm = 0.086 in. lb.

# Dimension tables for type G TU W

## Plug connector

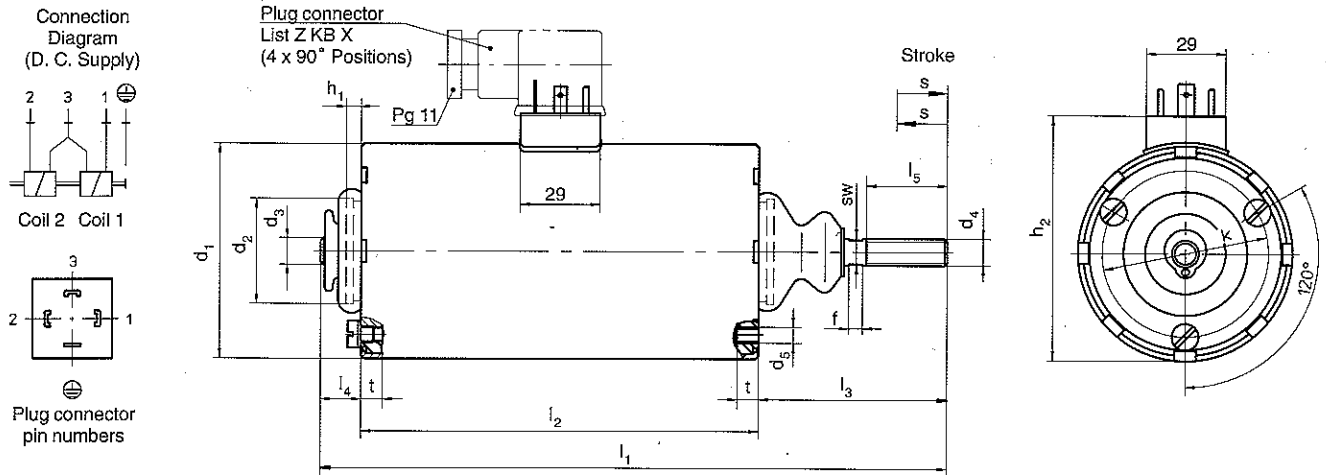


Fig. 4  
Type G TU W 040 T 43 A01 to  
G TU W 090 T 43 A01

## Terminal box

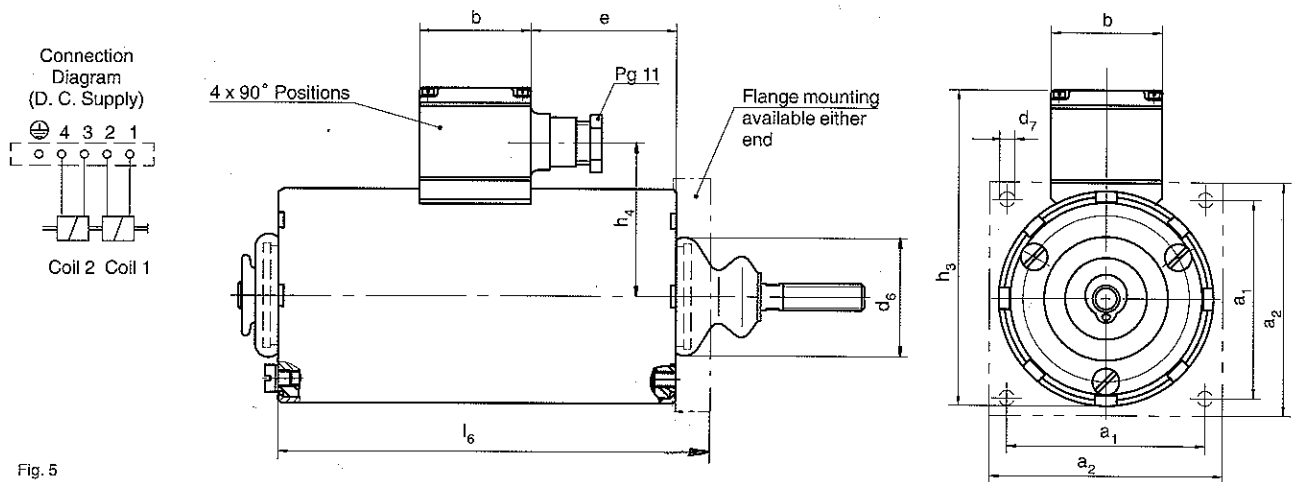


Fig. 5  
Type G TU W 040 T 43 A02 to  
G TU W 090 T 43 A02  
... A10 / A12 with rectifier (not size 040)

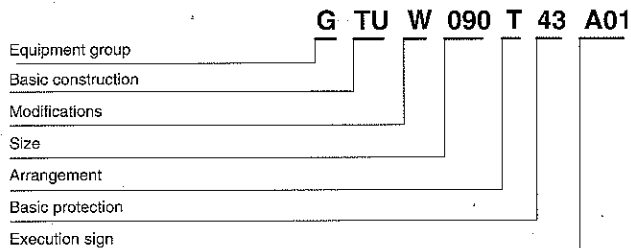
| Type           | G TU W   |      |      |     |     |     |                                  |          |       |       |       |       |       |  |
|----------------|----------|------|------|-----|-----|-----|----------------------------------|----------|-------|-------|-------|-------|-------|--|
| Size           | 040      | 050  | 060  | 070 | 080 | 090 | Size                             | 040      | 050   | 060   | 070   | 080   | 090   |  |
| Dim.           | Dims. mm |      |      |     |     |     | Dim.                             | Dims. mm |       |       |       |       |       |  |
| a <sub>1</sub> | 38       | 46   | 54   | 62  | 72  | 80  | h <sub>3</sub>                   | 77       | 87    | 97    | 116,5 | 126,5 | 136,5 |  |
| a <sub>2</sub> | 50       | 60   | 70   | 80  | 90  | 100 | h <sub>4</sub>                   | 38,5     | 43,5  | 48,5  | 57,5  | 62,5  | 67,5  |  |
| b              | 40       | 40   | 40   | 56  | 56  | 56  | k                                | 30       | 34    | 45    | 52    | 62    | 68    |  |
| d <sub>1</sub> | 40       | 50   | 60   | 70  | 80  | 90  | l <sub>1</sub>                   | 134      | 156   | 181   | 210   | 233   | 278   |  |
| d <sub>2</sub> | 22       | 25   | 32   | 38  | 42  | 52  | l <sub>2</sub>                   | 85       | 104   | 124   | 142   | 148   | 176   |  |
| d <sub>3</sub> | 5        | 5    | 6    | 8   | 10  | 12  | l <sub>3</sub>                   | 37       | 40    | 45    | 54    | 70    | 85    |  |
| d <sub>4</sub> | M5       | M5   | M6   | M8  | M10 | M12 | l <sub>4</sub>                   | 12       | 12    | 12    | 14    | 15    | 17    |  |
| d <sub>5</sub> | M3       | M4   | M5   | M5  | M6  | M6  | l <sub>5</sub>                   | 15       | 15    | 18    | 20    | 30    | 40    |  |
| d <sub>6</sub> | 24       | 27   | 34   | 40  | 44  | 54  | l <sub>6</sub>                   | 90       | 113,5 | 133,5 | 153   | 159   | 188   |  |
| d <sub>7</sub> | 4,8      | 5,8  | 5,8  | 7   | 9,5 | 9,5 | s                                | 8        | 10    | 12    | 15    | 20    | 25    |  |
| e              | 25,5     | 35   | 45   | 46  | 49  | 63  | t*                               | 4        | 5     | 5     | 5     | 8     | 10    |  |
| f              | 3        | 3    | 4    | 5   | 5   | 5   | SW                               | 4,5      | 4,5   | 5     | 7     | 9     | 10    |  |
| h <sub>1</sub> | 4        | 4    | 4    | 5   | 5   | 5   | Fork end <sup>1)</sup><br>Z GA K | 050      | 050   | 060   | 080   | 100   | 120   |  |
| h <sub>2</sub> | 51,5     | 61,5 | 71,5 | 90  | 100 | 110 |                                  |          |       |       |       |       |       |  |

1) List Z GA

\*Do not use overlength screws

# Classification of solenoids type G TU W

## Type code



## Order Example

|   |                        |         |
|---|------------------------|---------|
| 1. Equipment group                                | D.C. classification    | - G     |
| Basic construction                                |                        | - TU    |
| Modification                                      | Standard               | - W     |
| Size  | Select from tables     | - 090   |
| Arrangement                                       | Standard               | - T     |
| Protection  | - Plug connector       | - 43    |
|   | - Terminal box         | - 43    |
| Execution sign                                    | Plug connector         | - A01   |
|   | Terminal box           | - A02   |
|   | Rectifier/terminal box |         |
|   | (sizes 050, 060, 070)  | - A10   |
|   | (sizes 080, 090)       | - A12   |
| 2. State:   |                        |         |
| Voltage standards – page 2                        |                        | - 24 V  |
| Duty rating (ED %) – from tables                  |                        | - 100 % |
| (5, 15, 25, 40, 100 %)                            |                        |         |
| 3. Additional requirements:                       |                        |         |
| D.C. plug (3 pole/earth) Z KB X 311 B01           |                        |         |
| Flanges for mounting                              |                        |         |
| Special protection – tropical or special tropical |                        |         |
| Fork end Z GA page 3                              |                        |         |
| Spare bellows seals                               |                        |         |
| Shotbolt assembly for size 060                    |                        |         |

## Special

Special solenoids are available to meet the requirements of specific applications, such as short duty rating, high ambient temperature, special voltages etc., for which full operating, application and working conditions and environment should be specified in accordance with Technical Bulletins GXX.