Classes do seletor RC/RD/RDE/RE/RF

Folha suplementar / Dados técnicos

4360563/05 PT
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As instruções de serviço originais foram redigidas em alemão.
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1 Introdução

Esta documentação técnica serve como material auxiliar para a seleção do produto correto.

Uma descrição detalhada para montar, conectar e colocar o produto em funcionamento de modo correto e seguro pode ser encontrada no manual de montagem e colocação em funcionamento do respectivo produto.

Uma descrição detalhada para monitoração durante a operação, resolução de falhas e manutenção pode ser encontrada nas instruções de serviço do respectivo produto.

O público-alvo desta documentação técnica é exclusivamente o pessoal técnico autorizado e especialmente treinado.

1.1 Validade

Este documento aplica-se aos seguintes produtos:

- VACUTAP® VM® com seletor RC, RD, RDE
- OILTAP® R com seletor RC, RD, RDE, RE, RF
- OILTAP® M com seletor RC, RD, RDE

1.2 Integridade

Esta documentação técnica é completa somente se estiver acompanhada dos documentos complementares.

Os seguintes documentos são considerados documentos complementares:

- Dados técnicos TD 61 – Parte geral (pode ser obtido sob consulta)
- Dados técnicos – Parte específica do produto (pode ser obtido sob consulta), especialmente para:
  - VACUTAP® VM®: TD 2332907
  - OILTAP® R: TD 115
  - OILTAP® M: TD 050
- Documentação técnica recebida com a confirmação do pedido e com a entrega.

Além disso, observe as leis, normas e diretrizes gerais em vigor, assim como os regulamentos para prevenção de acidentes e proteção ambiental do respectivo país de utilização.
### 2 Geral

#### 2.1 Designações do comutador de derivação em carga VACUTAP® VM®

**Exemplo:** VM III 650 Y – 72,5 / RC – 10 19 1W R

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<th>Modelo</th>
<th>Parâmetros possíveis</th>
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</tr>
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<td></td>
<td></td>
<td>2 fases II</td>
</tr>
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<td></td>
<td></td>
<td></td>
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<td>VM I 802</td>
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</tr>
<tr>
<td>Y</td>
<td>Aplicações</td>
<td>apenas em caso de utilização com ponto neutro</td>
<td>Y</td>
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<tr>
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<td>$U_{nom} [kV] =$ tensão mais alta para componentes</td>
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<td>Classe do seletor</td>
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<td>RDE</td>
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<td>Quantidade de contatos do seletor:</td>
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</tr>
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<td>--------</td>
<td>----------------------</td>
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Tabela 1: Explicação da denominação de tipo do VACUTAP® VM® (1)

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<th>Modelo</th>
<th>Parâmetros possíveis</th>
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<tbody>
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<td>19</td>
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<td>W</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Tap enrolamento</td>
<td>G</td>
</tr>
<tr>
<td>1W</td>
<td>= Posições médias</td>
<td>0 posições médias (sem pré-se-</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>letor)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 posição média</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 posições médias</td>
<td>3</td>
<td></td>
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</table>

1W = Pré-seletor

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<th>Designação</th>
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<th>Modelo</th>
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<td>= Tipo da conexão ao potencial</td>
<td>lados</td>
<td>S</td>
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<td></td>
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<td>Interruptor de potencial e resisto-</td>
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<tr>
<td></td>
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<td>sistores de polarização</td>
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Tabela 2: Explicação da denominação de tipo do VACUTAP® VM® (2)
### 2.2 Designações do comutador de derivação em carga OILTAP® M

**Exemplo:** M III 600 Y – 72,5 / RC – 10 19 1W R

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<td>II</td>
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<td>III</td>
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<td>Y</td>
<td>Aplicações</td>
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Tabela 3: Explicação da denominação de tipo do OILTAP® M (1)
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<td></td>
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<td>3 posições médias</td>
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</tr>
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<td>1W</td>
<td>Pré-seletor</td>
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<td>W</td>
</tr>
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<td>Tap enrolamento grosso</td>
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<td>R</td>
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<td>Resistores de polarização instalados</td>
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<td></td>
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<td>Interruptor de potencial e resistores de polarização em placa</td>
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<td>Interruptor de potencial com resistores de polarização</td>
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Tabela 4: Explicação da denominação de tipo do OILTAP® M (2)
### 2.3 Designações do comutador de derivação em carga OILTAP® R

Exemplo: **R III 1200 Y – 72,5 / RC – 10 19 1W R**

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### Tabela 5: Explicação da denominação de tipo do OILTAP® R (1)

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<th>Parâmetros possíveis</th>
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### Tabela 6: Explicação da denominação de tipo do OILTAP® R (2)

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<th>Significado</th>
<th>Modelo</th>
<th>Parâmetros possíveis</th>
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</thead>
</table>
| 19         | = Número máximo de posições de serviço **com pré-seletor** (chave inversora ou tap enrolamento grosso) | Quantidade de contatos do seleto r de derivações:
|            |             | 10     | 19                   |
|            |             | 12     | 23                   |
|            |             | 14     | 27                   |
|            |             | 16     | 31                   |
|            |             | 18     | 35                   |
| 1W         | = Posições médias | 0 posições médias (sem pré-seletor) | 0 |
|            |             | 1 posição média | 1 |
|            |             | 3 posições médias | 3 |
| 1W         | = Pré-seletor | Chave inversora | W |
|            |             | Tap enrolamento grosso | G |
| R          | = Medidas de polarização | Resistores de polarização instalados | R |
|            |             | Interruptor de potencial e resistores de polarização em placa | S |
|            |             | Interruptor de potencial com resistores de polarização | P |
3 Dados técnicos

3.1 Esforços de tensão permitidos

Esta seção descreve os esforços de tensão permitidas de comutadores de derivação em carga monofásicos e multifásicos.

Ao selecionar o comutador de derivação em carga, é necessário verificar se os esforços máximos que ocorrem nos trechos de isolamento não ultrapassam as tensões suportáveis nominais correspondentes.

3.1.1 Trechos de isolamento - classe do seletor RC, RD, RDE, RE, RF

Figura 1: Trechos de isolamento - classe do seletor RC, RD, RDE, RE, RF
a0 | entre a derivação selecionada e pré-selecionada na chave de carga

a1 | entre contatos do seletor de derivações do enrolamento de um tap (conectados ou não conectados)

a | entre o começo e o fim de um enrolamento fino de tap e no modelo com enrolamento grosso também entre o começo e o fim de um enrolamento grosso.

Nota sobre a comutação do seletor grosso na posição (-) do pré-seletor:

Em caso de esforço com tensão de impulso, é necessário respeitar a tensão suportável permitida "a" entre o fim ligado com o contato do seletor de derivações K de um enrolamento grosso e o contato do seletor de derivações no fim do enrolamento fino de tap da mesma fase.

b | entre os contatos do seletor de derivações fino de fases diferentes e entre os contatos do pré-seletor de fases diferentes que estão ligados com o começo / fim de um enrolamento fino de tap ou com um contato do seletor de derivações

f | entre o contato de saída da chave de carga e a terra

Adicionalmente em caso de comutação do seletor grosso na posição (+) do pré-seletor:

c1 | de um contato do pré-seletor (-) para o contato de saída da mesma fase

c2 | entre os contatos do pré-seletor (-) de fases diferentes

Observação:

Os comutadores de derivação em carga VACUTAP® VM® e OILTAP® M podem ser combinados apenas com as classes do seletor RC, RD e RDE.
### 3.1.2 Comutações executáveis com as classes do seletor respectivas

As comutações executáveis a seguir também podem ser executadas com relação a pré-seletores com chave inversora e 3 posições médias (3W) e com relação a pré-seletores com tap enrolamento grosso e 3 posições médias (3G).

<table>
<thead>
<tr>
<th>Comutação</th>
<th>Classe do seletor</th>
<th>Comutação</th>
<th>Classe do seletor</th>
<th>Comutação</th>
<th>Classe do seletor</th>
</tr>
</thead>
<tbody>
<tr>
<td>10050</td>
<td>RC/RD/RDE/RE/RF</td>
<td>10071W</td>
<td>RC/RD/RDE</td>
<td>10071G</td>
<td>RC/RD/RDE</td>
</tr>
<tr>
<td>10060</td>
<td>RC/RD/RDE/RE/RF</td>
<td>10081W</td>
<td>RC/RD/RDE</td>
<td>10081G</td>
<td>RC/RD/RDE</td>
</tr>
<tr>
<td>10070</td>
<td>RC/RD/RDE/RE/RF</td>
<td>10091W</td>
<td>RC/RD/RDE</td>
<td>10091G</td>
<td>RC/RD/RDE</td>
</tr>
<tr>
<td>10080</td>
<td>RC/RD/RDE/RE/RF</td>
<td>12101W</td>
<td>RC/RD/RDE</td>
<td>12101G</td>
<td>RC/RD/RDE</td>
</tr>
<tr>
<td>10090</td>
<td>RC/RD/RDE/RE/RF</td>
<td>14111W</td>
<td>RC/RD/RDE</td>
<td>14111G</td>
<td>RC/RD/RDE</td>
</tr>
<tr>
<td>10100</td>
<td>RC/RD/RDE/RE/RF</td>
<td>14121W</td>
<td>RC/RD/RDE</td>
<td>14121G</td>
<td>RC/RD/RDE</td>
</tr>
<tr>
<td>12110</td>
<td>RC/RD/RDE/RE/RF</td>
<td>16131W</td>
<td>RC/RD/RDE</td>
<td>16131G</td>
<td>RC/RD/RDE</td>
</tr>
<tr>
<td>12120</td>
<td>RC/RD/RDE/RE/RF</td>
<td>16141W</td>
<td>RC/RD/RDE</td>
<td>16141G</td>
<td>RC/RD/RDE</td>
</tr>
<tr>
<td>14130</td>
<td>RC/RD/RDE/RE/RF</td>
<td>18151W</td>
<td>RC/RD/RDE</td>
<td>18151G</td>
<td>RC/RD/RDE</td>
</tr>
<tr>
<td>14140</td>
<td>RC/RD/RDE/RE/RF</td>
<td>18161W</td>
<td>RC/RD/RDE</td>
<td>18161G</td>
<td>RC/RD/RDE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18351W</td>
<td>RC/RD/RDE/RE/RF</td>
<td>18351G</td>
<td>RC/RD/RDE/RE/RF</td>
</tr>
</tbody>
</table>

Tabela 7: Comutações executáveis

Seletor em conformidade com a comutação 12111W(G) é executado como 14111W(G).

Seletor em conformidade com a comutação 14131W(G) é executado como 16131W(G).

Seletor em conformidade com a comutação 16151W(G) é executado como 18151W(G).

O seletor em conformidade a conexão 18171W(G) não é executável.

Observação:

Os comutadores de derivação em carga VACUTAP® VM® e OILTAP® M podem ser combinados apenas com as classes do seletor RC, RD e RDE.
### 3.1.3 Nível de isolamento nominal na chave de carga

#### Nível de isolamento nominal na chave de carga VACUTAP® VM®

<table>
<thead>
<tr>
<th>Distância de isolamento a0</th>
<th>VACUTAP® VM®</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impulso 1,2/50 µs</td>
<td>≤ 150 kV</td>
</tr>
<tr>
<td>Tensão de atuação do varistor com impulso de 1,2/50 µs ( (U_{100%}(t)<em>{normalizada} \neq U</em>{75%}(t)_{normalizada}) )</td>
<td>≥ 45 kV</td>
</tr>
<tr>
<td>Tensão residual com corrente de pico de 3 kA</td>
<td>56 kV</td>
</tr>
<tr>
<td>50 Hz, 1 min</td>
<td>20 kV</td>
</tr>
</tbody>
</table>

Tabela 8: VACUTAP® VM® Distância de isolamento a0

#### Nível de isolamento nominal na chave de carga OILTAP® M

<table>
<thead>
<tr>
<th>Distância de isolamento a0</th>
<th>OILTAP® M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impulso 1,2/50 µs</td>
<td>≤ 150 kV</td>
</tr>
<tr>
<td></td>
<td>≤ 150 kV</td>
</tr>
<tr>
<td>Tensão de atuação do centelhador com impulso de 1,2/50 µs</td>
<td>≥ 90 kV</td>
</tr>
<tr>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Tensão de atuação do varistor com impulso de 1,2/50 µs ( (U_{100%}(t)<em>{normalizada} \neq U</em>{75%}(t)_{normalizada}) )</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>≥ 45 kV</td>
</tr>
<tr>
<td>Tensão residual com corrente de pico de 3 kA</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>≤ 120 kV</td>
</tr>
<tr>
<td>50 Hz, 1 min</td>
<td>20 kV</td>
</tr>
</tbody>
</table>

Tabela 9: OILTAP® M Distância de isolamento a0

#### Nível de isolamento nominal na chave de carga OILTAP® R

<table>
<thead>
<tr>
<th>Distância de isolamento a0</th>
<th>OILTAP® R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Um ≤ 72,5 kV sem dispositivo de proteção contra sobretensão</td>
<td>Um &gt; 72,5 kV com condutor de descarga de ZnO, ( R2 \geq 2,33 \text{ Ohm} )</td>
</tr>
<tr>
<td>Um &gt; 72,5 kV com condutor de descarga de ZnO, ( R2 &lt; 2,33 \text{ Ohm} )</td>
<td></td>
</tr>
<tr>
<td>Impulso 1,2/50 µs</td>
<td>≤ 140 kV</td>
</tr>
<tr>
<td></td>
<td>≤ 150 kV</td>
</tr>
<tr>
<td></td>
<td>≤ 150 kV</td>
</tr>
<tr>
<td>Tensão de atuação do varistor com impulso de 1,2/50 µs ( (U_{100%}(t)<em>{normalizada} \neq U</em>{75%}(t)_{normalizada}) )</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>≥ 45 kV</td>
</tr>
<tr>
<td></td>
<td>≥ 55 kV</td>
</tr>
<tr>
<td>Tensão residual com corrente de pico de 3 kA</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>≤ 110 kV</td>
</tr>
<tr>
<td></td>
<td>≤ 85 kV</td>
</tr>
<tr>
<td>50 Hz, 1 min</td>
<td>30 kV</td>
</tr>
<tr>
<td></td>
<td>22 kV</td>
</tr>
<tr>
<td></td>
<td>27 kV</td>
</tr>
</tbody>
</table>

Tabela 10: OILTAP® R Distância de isolamento a0
### 3.1.4 Nível de isolamento de medição do isolamento interno no seletor R

A tensão de serviço máxima permitida em cada distância do seletor corresponde à metade dos valores indicados em seguida para a tensão a frequência industrial (AC).

**Tabela 11: Nível de isolamento de medição do isolamento interno no seletor R**

<table>
<thead>
<tr>
<th>Trecho de isolamento</th>
<th>Classe do seletor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RC</td>
</tr>
<tr>
<td>a1</td>
<td>LI</td>
</tr>
<tr>
<td></td>
<td>LIC</td>
</tr>
<tr>
<td></td>
<td>SI</td>
</tr>
<tr>
<td></td>
<td>AC</td>
</tr>
<tr>
<td>a</td>
<td>LI</td>
</tr>
<tr>
<td></td>
<td>LIC</td>
</tr>
<tr>
<td></td>
<td>SI</td>
</tr>
<tr>
<td></td>
<td>AC</td>
</tr>
<tr>
<td>b¹</td>
<td>LI</td>
</tr>
<tr>
<td></td>
<td>LIC</td>
</tr>
<tr>
<td></td>
<td>SI</td>
</tr>
<tr>
<td></td>
<td>AC</td>
</tr>
<tr>
<td>c1</td>
<td>LI</td>
</tr>
<tr>
<td></td>
<td>LIC</td>
</tr>
<tr>
<td></td>
<td>SI</td>
</tr>
<tr>
<td></td>
<td>AC</td>
</tr>
<tr>
<td>c2¹</td>
<td>LI</td>
</tr>
<tr>
<td></td>
<td>LIC</td>
</tr>
<tr>
<td></td>
<td>SI</td>
</tr>
<tr>
<td></td>
<td>AC</td>
</tr>
</tbody>
</table>

**LI:** Tensão de impulso atmosférico pleno (kV, 1,2/50 µs)

**LIC:** Tensão de impulso atmosférico cortado (kV, 1,2/50/3 µs)

**SI:** Tensão de impulso de manobra (kV, 250/2500 µs)

**AC:** Tensão a frequência industrial (kV, 50 Hz, 1 min)

¹ não aplicável em comutadores de derivação em carga monofásicos
3.2 Conexão ao potencial do enrolamento fino de tap

O enrolamento fino de tap é separado do enrolamento principal durante a sua comutação de modo galvânico por um período breve pela chave inversora ou seletor grosso. Com isso, ela recebe um potencial das tensões que resulta dos enrolamentos vizinhos e das capacidades de acoplamento a esses enrolamentos ou às peças aterradas.

Essa defasagem de potencial do enrolamento fino de tap ocasiona tensões correspondentes entre os contatos do pré-seletor desligados, pois um contato é sempre ligado ao enrolamento fino de tap e o outro contato é sempre ligado ao enrolamento principal. Essa tensão é denominada tensão de reaparição $U_W$.

Durante a separação dos contatos do pré-seletor, é necessário interromper uma corrente capacitiva que é condicionada pelas já mencionadas capacidades de acoplamento do enrolamento fino de tap. Essa corrente é denominada corrente de extinção $I_S$.

A tensão de reaparição $U_W$ e a corrente de extinção $I_S$ podem ocasionar o aparecimento de tensões de descarga não permitidas no pré-seletor. A faixa permitida de tensão de reaparição $U_W$ e de corrente de extinção $I_S$ está indicada nas ilustrações abaixo.

O “Active Gas Inhibition System” (AGIS) reduz a quantidade de gás gerada durante uma comutação do pré-seletor. Para obter mais informações sobre a tensão de reaparição e corrente de extinção, consulte os Dados Técnicos TD 61 - Parte geral.

### Tensão de reaparição $U_W$ e corrente de extinção $I_S$ sem resistor de polarização

<table>
<thead>
<tr>
<th>Classe do seletor</th>
<th>Tensão de reaparição ($U_W$) [kV]</th>
<th>Corrente de extinção ($I_S$) [mA]</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC, RD, RDE sem AGIS</td>
<td>50</td>
<td>300</td>
</tr>
<tr>
<td>RC, RD, RDE com AGIS</td>
<td>60</td>
<td>800</td>
</tr>
<tr>
<td>RE, RF com AGIS</td>
<td>65</td>
<td>1200</td>
</tr>
</tbody>
</table>

Figura 2: Valores aproximativos para $U_W$ e $I_S$ sem resistor de polarização $R_p$ para classes do seletor RC, RD, RDE, RE, RF
3 Dados técnicos

Tensão de reaparição $U_w$ e corrente de extinção $I_s$ com resistor de polarização

![Diagrama de valores aproximativos para $U_w$ e $I_s$ com resistor de polarização $R_p$ para classes do seletor RC, RD, RDE, RE, RF]

Figura 3: Valores aproximativos para $U_w$ e $I_s$ com resistor de polarização $R_p$ para classes do seletor RC, RD, RDE, RE, RF.

<table>
<thead>
<tr>
<th></th>
<th>Classe do seletor</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RC, RD, RDE sem AGIS</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Classe do seletor RE, RF com AGIS</td>
<td></td>
</tr>
</tbody>
</table>
4 Modelos especiais

4.1 Pontes paralelas para ligações em paralelo

As pontes paralelas possibilitam a distribuição da corrente aos contatos de conexão de 2 ou 3 níveis de seletor. Podem ser adquiridas pontes paralelas para os seguintes comutadores de derivação em carga:

VACUTAP® VM I 1503

OILTAP® M I 1503

OILTAP® R I 2002/2003 e OILTAP® R I 3003

As pontes paralelas nos contatos de conexão do seletor são obrigatórias se o enrolamento de tap tiver sido enrolado em dois ou mais condutores parciais e se cada uma dessas sessões de cabo for disposta como derivação para os contatos de conexão do seletor.

Esta medida impede que ocorra o seguinte:

- a transferência de correntes de compensação para os circuitos da corrente do seletor e da chave de carga
- um arco voltaico de comutação em pontes de contato deslocadas do seletor
- sobretensões entre os contatos de conexão do seletor adjacentes conectados em paralelo

4.2 VACUTAP® VM® Combinação de comutadores de derivação em carga para conexão delta

O comutador de derivação em carga VM II 652 também pode ser utilizado com o comutador de derivação em carga de uma coluna VM I 651 como combinação de comutadores de derivação em carga de duas colunas VM I 651/VM II 652 para a regulação da tensão de enrolamentos de transformador em conexão delta.

Essa combinação é designada VM III K (K representa “combinação”). Para isso, disponha os enrolamentos de tap de acordo com o seguinte gráfico:

Figura 4: Combinação de comutadores de derivação em carga VM III K para conexão delta VM I 651/VM II 652
(a = VM I 651, b = VM II 652)
4 Modelos especiais

4.3 OILTAP® M Combinação de comutadores de derivação em carga para conexão delta

O comutador de derivação em carga M II 602 também pode ser utilizado com o comutador de derivação em carga de uma coluna M I 601 como combinação de comutadores de derivação em carga de duas colunas M I 601/M II 602 para a regulação da tensão de enrolamentos de transformador em conexão delta.

Essa combinação é designada M III K ("K" representa combinação). Para isso, disponha os enrolamentos de tap de acordo com o seguinte gráfico:

![Diagrama de Comutador de Derivação em Carga M III K](image)

Figura 5: Combinação de comutadores de derivação em carga VM III K para conexão delta M I 601/M II 602 (a = M I 601, b = M II 602)

4.4 OILTAP® R Combinação de comutadores de derivação em carga para conexão delta

O comutador de derivação em carga R II 1202 também pode ser utilizado com o comutador de derivação em carga de uma coluna R I 1201 como combinação de comutadores de derivação em carga de duas colunas R I 1201/R II 1202 para a regulação da tensão de enrolamentos de transformador em conexão delta.
Essa combinação é designada R III K ("K" representa combinação). Para isso, disponha os enrolamentos de tap de acordo com o seguinte gráfico:

Figura 6: Combinação de comutadores de derivação em carga R III K para conexão delta R I 1201/R II 1202
(a = R I 1201, b = R II 1202)
5 Desenhos

5.1 Visão geral do tipo VACUTAP® VM® / OILTAP® M e OILTAP® R
ON-LOAD TAP-CHANGER OILTAP® M, VACUTAP® VM
TYPE OVERVIEW – SELECTOR SIZE RC/RD/RDE

SELECTOR SIZE RC 72,5kV DISPLAYED

VM I 651
VM I 802
VM I 1002
VM I 1203
M I 601
M I 802
M I 1203

VM I 1503

VM II 652
M II 602

VM III 650 Y
M III 600 Y

SELECTOR SIZE RD / RDE

VM I 651
VM I 802
VM I 1002
VM I 1203
M I 601
M I 802
M I 1203

VM I 1503

VM II 652
M II 602

VM III 650 Y
M III 600 Y

SELECTOR SIZE RC 72,5kV DISPLAYED

VM I 651
VM I 802
VM I 1002
VM I 1203
M I 601
M I 802
M I 1203

VM I 1503

VM II 652
M II 602

VM III 650 Y
M III 600 Y

SELECTOR SIZE RD / RDE

VM I 651
VM I 802
VM I 1002
VM I 1203
M I 601
M I 802
M I 1203

VM I 1503

VM II 652
M II 602

VM III 650 Y
M III 600 Y

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<table>
<thead>
<tr>
<th>Um (kV)</th>
<th>h (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>72,5</td>
<td>1865</td>
</tr>
<tr>
<td>123</td>
<td>1795</td>
</tr>
<tr>
<td>170</td>
<td>1925</td>
</tr>
<tr>
<td>245</td>
<td>2025</td>
</tr>
<tr>
<td>300</td>
<td>2177</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Um (kV)</th>
<th>h (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>72,5</td>
<td>1865</td>
</tr>
<tr>
<td>123</td>
<td>1795</td>
</tr>
<tr>
<td>170</td>
<td>1925</td>
</tr>
<tr>
<td>245</td>
<td>2025</td>
</tr>
<tr>
<td>300</td>
<td>2177</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<th>h (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>72,5</td>
<td>2055</td>
</tr>
<tr>
<td>123</td>
<td>2155</td>
</tr>
<tr>
<td>170</td>
<td>2265</td>
</tr>
<tr>
<td>245</td>
<td>2365</td>
</tr>
<tr>
<td>300</td>
<td>2477</td>
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<table>
<thead>
<tr>
<th>Um (kV)</th>
<th>h (mm)</th>
</tr>
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<tbody>
<tr>
<td>72,5</td>
<td>2055</td>
</tr>
<tr>
<td>123</td>
<td>2155</td>
</tr>
<tr>
<td>170</td>
<td>2265</td>
</tr>
<tr>
<td>245</td>
<td>2365</td>
</tr>
<tr>
<td>300</td>
<td>2477</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Um (kV)</th>
<th>h (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>72,5</td>
<td>2055</td>
</tr>
<tr>
<td>123</td>
<td>2155</td>
</tr>
<tr>
<td>170</td>
<td>2265</td>
</tr>
<tr>
<td>245</td>
<td>2365</td>
</tr>
<tr>
<td>300</td>
<td>2477</td>
</tr>
</tbody>
</table>
ON-LOAD TAP-CHANGER OILTAP® R
TYPE OVERVIEW - SELECTOR SIZE RC/RD/ROE

SELECTOR SIZE RC 72.5kV DISPLAYED

WITHOUT CHANGE-OVER SELECTOR W, G

WITH CHANGE-OVER SELECTOR
(REVERSING / COARSE CHANGE-OVER SELECTOR)
5.2 Diagramas básicos de circuito, designação de contatos segundo o padrão MR
ON-LOAD TAP-CHANGER OILTAP® M, R, R, G AND VACUTAP® VM, VR
BASIC CONNECTION DIAGRAMS
WITH COARSE CHANGE-OVER SELECTOR
5.3 Desenhos cotados VACUTAP® VM® e OILTAP® M
ON-LOAD TAP-CHANGER OILTAP® M, VACUTAP® VM
MIII600Y, VMIII650Y-725...245-RC/RD/RDE
DIMENSION DRAWING

FOR THE TYPE OF OLT-HEAD REFER TO ORDER-SPECIFIC DRAWING OF THE OLT-HEAD AND DRIVE SHAFTS

1. DRIVE SIDE OF SELECTOR
2. ON-LOAD TAP-CHANGER CURRENT TAKE-OFF TERMINAL
3. IS CONNECTED TO POTENTIAL OF 1
4. SHIELDING RINGS FOR UM OF 170 kV OR GREATER
5. SUPPORTING FLANGE FOR BELL-TYPE TANK INSTALLATION IS OPTIONAL
6. BOTTOM-MOST LIVE PARTS, THESE ARE CONNECTED TO THE POTENTIAL OF THE ASSOCIATED AND/OR WIRED CONNECTION CONTACT
7. SELECTOR BASE IS MADE OF INSULATING MATERIAL

- THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE CONNECTION CONTACTS AND PHASES
- C-C REFER TO 10009030
- B-D - TYPE WITH CONNECTING LEAD 3W/3G REFER TO 10010019
- FOR INHERENT DRAWINGS REFER TO 10009819

WITH CHANGE-OVER SELECTOR
REVERSING / COARSE CHANGE-OVER SELECTOR

WITHOUT CHANGE-OVER SELECTOR

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OILTAP® M / VACUTAP® VM

DIMENSIONS

[mm]
### OILTAP® M / VACUTAP® VM

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<td>n</td>
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<td>o</td>
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**DIMENSIONS (mm):**

- **h:** 205, 215, 2265, 2365, 2517, 2656, 2295, 2425, 2525, 2677
- **b:** 478, 478, 478, 478, 478, 478, 478, 478, 478, 478
- **c:** 996, 1126, 1256, 1356, 1508, 1506, 1026, 1026, 1026, 1026
- **j:** - , - , 309, 409, 520, - , - , 309, 409, 520
- **k:** - , - , 191, 191, 191, - , - , 191, 191, 191
- **l:** 319, 399, - , - , - , - , - , - , - , -
- **m:** 170, 210, - , - , - , - , - , - , - , -
- **n:** 340, 620, - , - , - , - , - , - , - , -
- **o:** 489, 699, - , - , - , - , - , - , - , -

**Oil Volume (dm³):**

- 130, 150, 170, 190, 210, 130, 150, 170, 190, 210

**Displacement (dm³):**

- 203, 226, 259, 277, 304, 207, 230, 263, 281, 308

**Max. Weight (kg):**

- M: 440, 345, 350, 355, 360, 347, 352, 357, 362, 367
- VM: 370, 375, 380, 385, 390, 377, 382, 387, 392, 397
## OILTAP® M / VACUTAP® VM

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OILTAP® M / VACUTAP® VM
M601, VM651-72.5-300-RC/RO/RDE
DIMENSION DRAWING

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## OILTAP® M / VACUTAP® VM

### Dimensions [mm]

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### OIL VOLUME [dm³]

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### MAX. WEIGHT [kg]

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ON-LOAD TAP-CHANGER OILTAP® M, VACUTAP® VM
M11203, VM11203-725...300-RC/RD/RDE
DIMENSION DRAWING

- Drive side of selector
- On-load tap-changer current take-off terminal
- Is connected to potential of A
- Shielding rings for UM of 170 kV or greater
- Supporting flange for bell-type tank installation is optional
- Bottom-most live parts, these are connected to the potential of the associated and/or wired connection contact
- Selector base is made of insulating material

The detailed connection diagram is binding for the designation of the connection contacts and phases

- C-C refer to 10009030
- B-D - Type with connecting lead 3W/3G refer to 10010019
- For inherent drawings refer to 10009819
## OILTAP® M / VACUTAP® VM

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### MATERIAL NUMBER

- OILTAP® M
- VACUTAP® VM

### SERIAL NUMBER

- MI1203, VM1203-72.5_300-RC/ROD/ROE

### DIMENSION DRAWING

- Scale: 1:10
- Name: MENSCHENFABRIK REINHAUSEN GMBH
- Date: 23.01.2018

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ON-LOAD TAP-CHANGER OILTAP® M, VACUTAP® VM
MI1503, VM1503-725...300-RC/RO/RDE
DIMENSION DRAWING

- DRIVE SIDE OF SELECTOR
- ON-LOAD TAP-CHANGER CURRENT TAKE-OFF TERMINAL
- IS CONNECTED TO POTENTIAL OF A
- SHELDING RINGS FOR UM OF 170 kV OR GREATER
- SUPPORTING FLANGE FOR BELL-TYPE TANK INSTALLATION IS OPTIONAL
- BOTTOM-MOST LIVE PARTS, THESE ARE CONNECTED TO THE POTENTIAL OF THE ASSOCIATED AND/OR WIRED CONNECTION CONTACT
- SELECTOR BASE IS MADE OF INSULATING MATERIAL

- THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE CONNECTION CONTACTS AND PHASES
- C-C REFER TO 10009030
- B-D - TYPE WITH CONNECTING LEAD 3W/3G REFER TO 100091019
- FOR INHERENT DRAWINGS REFER TO 10009189
- CONNECTING OF PARALLEL SELECTOR PLANES REFER TO 10009916
# OILTAP® M / VACUTAP® VM

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## OIL VOLUME [dm³]

| 190  | 170  | 190  | 210  | 190  | 190  | 210  | 190  | 190  | 210  |
| 220  | 243  | 276  | 294  | 321  | 222  | 245  | 278  | 296  | 323  |

## DISPLACEMENT [dm³]

| 356  | 361  | 366  | 371  | 376  | 360  | 365  | 370  | 375  | 380  |

## MAX. WEIGHT [kg]

| VM | 386  | 391  | 396  | 401  | 406  | 390  | 395  | 400  | 405  | 410  |

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5.4 Desenhos cotados OILTAP® R
5.4 Desenhos cotados OILTAP® R

Maschinenfabrik Reinhausen 2020
FOR THE TYPE OF OLTC-HEAD REFER TO THE ORDER-SPECIFIC DRAWING OF THE OLTC-HEAD AND DRIVE SHAFTS.

- DRIVE SIDE OF SELECTOR
- ON-LOAD TAP-CHANGER CURRENT TAKE-OFF TERMINAL
- IS CONNECTED TO POTENTIAL OF A
- SHIELDING RINGS FOR UM OF 170 KV OR GREATER
- SUPPORTING FLANGE FOR THE BELL-TYPE TANK INSTALLATION
  - WITH 72.5kV-300kV AVAILABLE
  - WITH 362kV OBLIGATORY
- BOTTOM-MOST LIVE PARTS; THESE ARE CONNECTED TO THE POTENTIAL OF THE ASSOCIATED AND/OR WIRED CONNECTION CONTACT
- SELECTOR BASE IS MADE OF INSULATING MATERIAL

- THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE CONNECTION CONTACTS AND PHASES
- C-C REFER TO 10009030
- FOR INHERENT DRAWINGS REFER TO 10009731
- D-D - TYPE WITH CONNECTING LEAD 3W/3G REFER TO 10010019

ON-LOAD TAP-CHANGER OILTAP® R
RIII1200Y-72.5...362-RC/RD/ROE
DIMENSION DRAWING

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### OILTAP® R

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ON-LOAD TAP-CHANGER OILTAP® R
RII202-725_362-RC/RD/RDE
DIMENSION DRAWING

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FOR THE TYPE OF OILTAP-HEAD REFER TO THE ORDER-SPECIFIC DRAWING OF THE OILTAP-HEAD AND DRIVE SHAFTS

- DRIVE SIDE OF SELECTOR
- ON-LOAD TAP-CHANGER CURRENT TAKE-OFF TERMINAL
- IS CONNECTED TO POTENTIAL OF (A)
- SHIELDING RINGS FOR UM OF 170 kV OR GREATER
- SUPPORTING FLANGE FOR THE BELL-TYPE TANK INSTALLATION: WITH 72.5kV-300kV AVAILABLE WITH 362kV OBLIGATORY
- BOTTOM-MOST LIVE PARTS, THESE ARE CONNECTED TO THE POTENTIAL OF THE ASSOCIATED AND/OR WIRED CONNECTION CONTACT
- SELECTOR BASE IS MADE OF INSULATING MATERIAL
- THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE CONNECTION CONTACTS AND PHASES
- C-C REFER TO 10009030
- FOR INHERENT DRAWINGS REFER TO 10009731
- D-D - TYPE WITH CONNECTING LEAD 3W/3G REFER TO 10010019

A-A
F-F
120°
120°
10° 10°
10° 10°
10°
40
120°
120°

B-B

FOR THE TYPE OF OILTAP-HEAD REFER TO THE ORDER-SPECIFIC DRAWING OF THE OILTAP-HEAD AND DRIVE SHAFTS

- DRIVE SIDE OF SELECTOR
- ON-LOAD TAP-CHANGER CURRENT TAKE-OFF TERMINAL
- IS CONNECTED TO POTENTIAL OF (A)
- SHIELDING RINGS FOR UM OF 170 kV OR GREATER
- SUPPORTING FLANGE FOR THE BELL-TYPE TANK INSTALLATION: WITH 72.5kV-300kV AVAILABLE WITH 362kV OBLIGATORY
- BOTTOM-MOST LIVE PARTS, THESE ARE CONNECTED TO THE POTENTIAL OF THE ASSOCIATED AND/OR WIRED CONNECTION CONTACT
- SELECTOR BASE IS MADE OF INSULATING MATERIAL
- THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE CONNECTION CONTACTS AND PHASES
- C-C REFER TO 10009030
- FOR INHERENT DRAWINGS REFER TO 10009731
- D-D - TYPE WITH CONNECTING LEAD 3W/3G REFER TO 10010019
### OILTAP® R

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ON-LOAD TAP-CHANGER OILTAP® R
R1201-725...362-RC/RO/ROE
DIMENSION DRAWING

FOR THE TYPE OF OILTAP-HEAD REFER TO THE ORDER-SPECIFIC DRAWING OF THE OILTAP-HEAD AND DRIVE SHAFTS

- DRIVE SIDE OF SELECTOR
- ON-LOAD TAP-CHANGER CURRENT TAKE-OFF TERMINAL
- IS CONNECTED TO POTENTIAL OF A
- SHIELDING RINGS FOR U.M. OF 170 kV OR GREATER
- SUPPORTING FLANGE FOR THE BELL-TYPE TANK INSTALLATION WITH 72.5 kV-300 kV AVAILABLE WITH 36.2 kV OBLIGATORY
- BOTTOM-MOST LIVE PARTS, THESE ARE CONNECTED TO THE POTENTIAL OF THE ASSOCIATED AND/OR WIRED CONNECTION CONTACT
- SELECTOR BASE IS MADE OF INSULATING MATERIAL
- THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE CONNECTION CONTACTS AND PHASES
- C-C REFER TO 10009030
- FOR INHERENT DRAWINGS REFER TO 10009731
- D-D - TYPE WITH CONNECTING LEAD 3W/3G REFER TO 10010019

- WITH CHANGE-OVER SELECTOR (REVERSING / COARSE CHANGE-OVER SELECTOR) W, G

- WITHOUT CHANGE-OVER SELECTOR O
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FOR THE TYPE OF OLTC-HEAD REFER TO THE ORDER-SPECIFIC DRAWING OF THE OLTC-HEAD AND DRIVE SHAFTS

- DRIVE SIDE OF SELECTOR
- ON-LOAD TAP-CHANGER CURRENT TAKE-OFF TERMINAL
- IS CONNECTED TO POTENTIAL OF A
- SHIELDING RINGS FOR UM OF 170 kV OR GREATER
- SUPPORTING FLANGE FOR THE BELL-TYPE TANK INSTALLATION WITH 72.5kV-300kV AVAILABLE WITH 362kV OBLIGATORY
- BOTTOM-MOST LIVE PARTS, THESE ARE CONNECTED TO THE POTENTIAL OF THE ASSOCIATED AND/OR WIRED CONNECTION CONTACT
- SELECTOR BASE IS MADE OF INSULATING MATERIAL

- THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE CONNECTION CONTACTS AND PHASES
- C-C REFER TO 1000930
- FOR INHERENT DRAWINGS REFER TO 10009731
- D-D - TYPE WITH CONNECTING LEAD 3W/3G REFER TO 1001019

- WITHOUT CHANGE-OVER SELECTOR

- WITH CHANGE-OVER SELECTOR (REVERSING / COARSE CHANGE-OVER SELECTOR)

ON-LOAD TAP-CHANGER OILTAP® R
RH202-72.5/362-RC/RO/ROE
DIMENSION DRAWING
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**OIL VOLUME [dm³]**

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**DISPLACEMENT [dm³]**

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**MAX. WEIGHT [KG]**

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ON-LOAD TAP-CHANGER OILTAP® R
RI2002-725..362-RC/RD/RDE
DIMENSION DRAWING

FOR THE TYPE OF OILTAP®-HEAD REFER TO THE ORDER-SPECIFIC DRAWING OF THE OILTAP®-HEAD AND DRIVE SHAFTS

- DRIVE SIDE OF SELECTOR
- ON-LOAD TAP-CHANGER CURRENT TAKE-OFF TERMINAL
- IS CONNECTED TO POTENTIAL OF
- SHIELDING RINGS FOR UM OF 170 kV OR GREATER
- SUPPORTING FLANGE FOR THE BELL-TYPE TANK INSTALLATION: 72.5kV-300kV AVAILABLE WITH 362kV OBLIGATORY
- BOTTOM-MOST LIVE PARTS, THESE ARE CONNECTED TO THE POTENTIAL OF THE ASSOCIATED AND/OR WIRED CONNECTION CONTACT
- SELECTOR BASE IS MADE OF INSULATING MATERIAL

- THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE CONNECTION CONTACTS AND PHASES
- C-C REFER TO 10009030
- FOR INHERENT DRAWINGS REFER TO 10009731
- D-D - TYPE WITH CONNECTING LEAD 3W/3G REFER TO 10001919
- CONNECTING OF PARALLEL SELECTOR PLANES REFER TO 10009916
### OILTAP® R

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**DIMENSIONS [mm]**

| k             | 969     |
| n             | 319     |
| q             | 150     |
| t             | 170     |
| r             | 150     |
| q             | 639     |

| OIL VOLUME [dm³] | 168   | 188  | 203  | 218  | 240  | 255  |
|DISPLACEMENT [dm³] | 278   | 301  | 329  | 347  | 373  | 417  |
| MAX. WEIGHT [KG] | 462   | 467  | 472  | 477  | 482  | 487  |

### OILTAP® R

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**DIMENSIONS [mm]**

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| q             | 150     |
| t             | 210     |
| r             | 150     |
| q             | 779     |

| OIL VOLUME [dm³] | 168   | 188  | 203  | 218  | 240  | 255  |
| DISPLACEMENT [dm³] | 278   | 301  | 329  | 347  | 373  | 417  |
| MAX. WEIGHT [KG] | 462   | 467  | 472  | 477  | 482  | 487  |
ON-LOAD TAP-CHANGER OILTAP® R
RI2003-725_362-RC/RO/ROE
DIMENSION DRAWING
# OILTAP® R

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### Oil Volume (dm³)

- 72.5: 168
- 123: 188
- 170: 203
- 245: 218
- 300: 240
- 362: 255

### Displacement (dm³)

- 72.5: 278
- 123: 301
- 170: 329
- 245: 347
- 300: 373
- 362: 417

### Max. Weight (KG)

- 72.5: 462
- 123: 467
- 170: 472
- 245: 477
- 300: 482
- 362: 487

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ON-LOAD TAP-CHANGER OILTAP® R
RI2402-725_362-RC/RO/ROE - WITH FORCED CURRENT SPLITTING
DIMENSION DRAWING

- DRIVE SIDE OF SELECTOR
- ON-LOAD TAP-CHANGER CURRENT TAKE-OFF TERMINAL
- IS CONNECTED TO POTENTIAL OF (A)
- SHIELDING RINGS FOR U.M. OF 170 kV OR GREATER
- SUPPORTING FLANGE FOR THE BELL-TYPE TANK INSTALLATION
  WITH 72.5kV-300kV AVAILABLE
  WITH 362kV OBLIGATORY
- THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE
  CONNECTION CONTACTS AND PHASES
- C-C REFER TO 10009030
- FOR INHERENT DRAWINGS REFER TO 10009731
- D-D - TYPE WITH CONNECTING LEAD 3W/3G REFER TO 10010019

1. BOTTOM-MOST LIVE PARTS, THESE ARE CONNECTED TO THE
   POTENTIAL OF THE ASSOCIATED AND/OR WIRED CONNECTION CONTACT
2. SELECTOR BASE IS MADE OF INSULATING MATERIAL

FOR THE TYPE OF OLTC-HEAD REFER TO THE ORDER-SPECIFIC
DRAWING OF THE OLTC-HEAD AND DRIVE SHAFTS
# OILTAP® R

## Selecotor Size

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| k      | 969  |
| n      | 399  |
| o      | 190  |
| t      | 110  |
| r      | 190  |
| q      | 699  |

### Oil Volume [dm³]

| 168 | 188 | 203 | 218 | 240 | 255 |

### Displacement [dm³]

| 278 | 301 | 329 | 437 | 373 | 447 |

### Max Weight [kg]

| 462 | 467 | 472 | 477 | 482 | 487 |

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# OILTAP® R

## Selecotor Size

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| k      | 1049 |
| n      | 399  |
| o      | 190  |
| t      | 110  |
| r      | 190  |
| q      | 719  |

### Oil Volume [dm³]

| 168 | 188 | 203 | 218 | 240 | 255 |

### Displacement [dm³]

| 280 | 303 | 331 | 369 | 375 | 449 |

### Max Weight [kg]

| 467 | 472 | 477 | 482 | 487 | 492 |

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ON-LOAD TAP-CHANGER OILTAP® R
R3003-725…362-RC/RD/RDE
DIMENSION DRAWING

- DRIVE SIDE OF SELECTOR
- ON-LOAD TAP-CHANGER CURRENT TAKE-OFF TERMINAL
- IS CONNECTED TO POTENTIAL OF (A)
- SHIELDING RINGS FOR LM OF 170 kV OR GREATER
- SUPPORTING FLANGE FOR THE BELL-TYPE TANK INSTALLATION
- WITH 72.5 kV-300 kV AVAILABLE
- WITH 36 kV OBLIGATORY

1 - BOTTOM-MOST LIVE PARTS, THESE ARE CONNECTED TO THE POTENTIAL OF THE ASSOCIATED AND/OR WIRED CONNECTION CONTACT
2 - SELECTOR BASE IS MADE OF INSULATING MATERIAL

- THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE CONNECTION CONTACTS AND PHASES
- C - REFER TO 10009030
- FOR INHERENT DRAWINGS REFER TO 10009731
- D-D - TYPE WITH CONNECTING LEAD 3W/3G REFER TO 10000019
- CONNECTING OF PARALLEL SELECTOR PLANES REFER TO 10009916

FOR THE TYPE OF OLTC-HEAD REFER TO THE ORDER-SPECIFIC DRAWING OF THE OLTC-HEAD AND DRIVE SHAFTS

- WITHOUT CHANGE-OVER SELECTOR
- WITH CHANGE-OVER SELECTOR (REVERSING / COARSE CHANGE-OVER SELECTOR)

- DRIVE SIDE OF SELECTOR
- ON-LOAD TAP-CHANGER CURRENT TAKE-OFF TERMINAL
- IS CONNECTED TO POTENTIAL OF (A)
- SHIELDING RINGS FOR UM OF 170 kV OR GREATER
- SUPPORTING FLANGE FOR THE BELL-TYPE TANK INSTALLATION
- WITH 72.5 kV-300 kV AVAILABLE
- WITH 36 kV OBLIGATORY

1 - BOTTOM-MOST LIVE PARTS, THESE ARE CONNECTED TO THE POTENTIAL OF THE ASSOCIATED AND/OR WIRED CONNECTION CONTACT
2 - SELECTOR BASE IS MADE OF INSULATING MATERIAL

- THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE CONNECTION CONTACTS AND PHASES
- C - REFER TO 10009030
- FOR INHERENT DRAWINGS REFER TO 10009731
- D-D - TYPE WITH CONNECTING LEAD 3W/3G REFER TO 10000019
- CONNECTING OF PARALLEL SELECTOR PLANES REFER TO 10009916
### OILTAP® R

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**DIMENSIONS (mm)**

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**OIL VOLUME [dm³]**

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**DIMENSIONS [mm]**

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FOR THE TYPE OF OLTC-HEAD REFER TO THE ORDER-SPECIFIC DRAWING OF THE OLTC-HEAD AND DRIVE SHAFTS

M - DRIVE SIDE OF SELECTOR
A - ON-LOAD TAP-CHANGER CURRENT TAKE-OFF TERMINAL
C - SUPPORTING FLANGE FOR BELL-TYPE TANK INSTALLATION WITH 72.5kV-315kV AVAILABLE WITH 362kV OBLIGATORY
D - REVERSING CHANGE-OVER SELECTOR (W)
G - COARSE CHANGE-OVER SELECTOR (G)
O - CONNECTION CONTACTS AND PHASES
W - ON-INHERENT DRAWINGS REFER TO 10009731
E - TYPE WITH CONNECTING LEAD 3W/3E REFER TO 10017264

- THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE ASSOCIATED AND/OR WIRED CONNECTION CONTACT

1. BOTTOM-LEFT LIVE PARTS, THESE ARE CONNECTED TO THE POTENTIAL OF THE ASSOCIATED AND/OR WIRED CONNECTION CONTACT
2. SELECTOR BASE IS MADE OF INSULATING MATERIAL

ON-LOAD TAP-CHANGER OILTAP® R
R III 200Y-725.362-RE/RF
DIMENSION DRAWING
### OILTAP® R

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#### DIMENSIONS (mm)
- k: 1850
- n: 440
- o: -
- t: 230
- p: 290
- r: 520
- g: 630

#### OIL VOLUME [dm³]
- 368
- 188
- 203
- 218
- 240
- 255

#### DISPLACEMENT [dm³]
- 331
- 354
- 382
- 400
- 426
- 470

#### MAX WEIGHT [kg]
- 624
- 629
- 634
- 639
- 644
- 644

### OILTAP® R

#### SELECTOR SIZE
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#### DIMENSIONS (mm)
- k: 2010
- n: 440
- o: -
- t: 230
- p: 370
- r: 600
- g: 630

#### OIL VOLUME [dm³]
- 168
- 188
- 203
- 218
- 240
- 255

#### DISPLACEMENT [dm³]
- 336
- 359
- 387
- 405
- 431
- 475

#### MAX WEIGHT [kg]
- 638
- 643
- 648
- 653
- 658
- 658
For the type of OLTC-head refer to the order-specific drawing of the OLTC-head and drive shafts.

**M** - Drive side of selector

**A** - On-load tap-changer current take-off terminal

**B** - Is connected to potential of (A)

**C** - Shielding rings for UM of 170 kV or greater

**D** - Supporting flange for bell-type tank installation with 72.5kV-315kV available with 362kV obligatory

**1** - Bottom-most live parts; these are connected to the potential of the associated and/or wired connection contact

**2** - Selector base is made of insulating material

- The detailed connection diagram is binding for the designation of the connection contacts and phases
- C-C refer to 10016570
- For inherent drawings refer to 10009731
- D-D - Type with connecting lead 3W/16 refer to 10017264

**ON-LOAD TAP-CHANGER OILTAP® R**

**RIH202-725_362-RE/RF**

**DIMENSION DRAWING**
## OILTAP® R

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### DIMENSIONS (mm)

| OIL VOLUME (dm³) | 168 | 188 | 203 | 218 | 240 | 255 |
| DISPLAYMENT (dm³) | 301 | 324 | 352 | 370 | 396 | 440 |
| MAX. WEIGHT (kg) | 537 | 542 | 547 | 552 | 557 | 562 |

### OILTAP® R

### SELECTOR SIZE

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### DIMENSIONS (mm)

| OIL VOLUME (dm³) | 168 | 188 | 203 | 218 | 240 | 255 |
| DISPLAYMENT (dm³) | 304 | 327 | 355 | 373 | 399 | 443 |
| MAX. WEIGHT (kg) | 544 | 549 | 554 | 559 | 564 | 569 |
FOR THE TYPE OF OLTC-HEAD REFER TO THE ORDER-SPECIFIC DRAWING OF THE OLTC-HEAD AND DRIVE SHAFTS

- DRIVE SIDE OF SELECTOR
- ON-LOAD TAP-CHANGER CURRENT TAKE-OFF TERMINAL
- IS CONNECTED TO POTENTIAL OF A
- SHIELDING RINGS FOR UTM OF 170 KV OR GREATER
- SUPPORTING FLANGE FOR BELL-TYPE TANK INSTALLATION WITH 725KV-300KV AVAILABLE WITH 362KV OBBLIGATORY
- BOTTOM-MOST LIVE PARTS, THESE ARE CONNECTED TO THE POTENTIAL OF THE ASSOCIATED AND/OR WIRED CONNECTION CONTACT
- SELECTOR BASE IS MADE OF INSULATING MATERIAL

- THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE CONNECTION CONTACTS AND PHASES
- C-C REFER TO 10016570
- FOR INHERENT DRAWINGS REFER TO 10009731
- D-D - TYPE WITH CONNECTING LEAD 3W036 REFER TO 10017264
FOR THE TYPE OF OLT-HEAD REFER TO THE ORDER-SPECIFIC DRAWING OF THE OLT-HEAD AND DRIVE SHAFTS.

- DRIVE SIDE OF SELECTOR
- ON-LOAD TAP-CHANGER CURRENT TAKE-OFF TERMINAL
- IS CONNECTED TO POTENTIAL OF A
- SHIELDING RINGS FOR LMT OF 170 KV OR GREATER
- SUPPORTING FLANGE FOR BELL-TYPE TANK INSTALLATION WITH 725KV-300KV AVAILABLE WITH 362KV OBLIGATORY
- BOTTOM-MOST LIVE PARTS, THESE ARE CONNECTED TO THE POTENTIAL OF THE ASSOCIATED AND/OR WIRED CONNECTION CONTACT
- SECTOR BASE IS MADE OF INSULATING MATERIAL
## OILTAP® R

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### DIMENSIONS (mm)

| OIL VOLUME (dm³) | 868 | 988 | 203 | 218 | 240 | 255 |
| DISPLACEMENT (dm³) | 278 | 301 | 329 | 347 | 373 | 417 |
| MAX. WEIGHT (kg) | 465 | 470 | 475 | 480 | 485 | 490 |
FOR THE TYPE OF OLTC-HEAD REFER TO THE ORDER-SPECIFIC DRAWING OF THE OLTC-HEAD AND DRIVE SHAFTS

- THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE CONNECTION CONTACTS AND PHASES
  - C-C REFER TO 10016570
  - FOR INHERENT DRAWINGS REFER TO 10009731
  - D-D - TYPE WITH CONNECTING LEAD 3W/36 REFER TO 10017264

1. DRIVE SIDE OF SELECTOR
2. ON-LOAD TAP-CHANGER CURRENT TAKE-OFF TERMINAL
3. IS CONNECTED TO POTENTIAL OF 'A'
4. SHIELDING RINGS FOR UMT OF 170 KV OR GREATER
5. SUPPORTING FLANGE FOR BELL-TYPE TANK INSTALLATION WITH 725KV-330KV AVAILABLE WITH 362KV OBLIGATORY
6. BOTTOM-MOST LIVE PARTS; THESE ARE CONNECTED TO THE POTENTIAL OF THE ASSOCIATED AND/OR WIRED CONNECTION CONTACT
7. SELECTOR BASE MADE OF INSULATING MATERIAL

ON-LOAD TAP-CHANGER OILTAP® R
RI2402-725_362-RE - WITH FORCED CURRENT SPLITTING
DIMENSION DRAWING
## OILTAP® R

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<th>72.5</th>
<th>123</th>
<th>170</th>
<th>245</th>
<th>300</th>
<th>362</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Um [kV])</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>h</td>
<td>2645</td>
<td>2615</td>
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<td>3091</td>
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<tr>
<td>i</td>
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<td>-</td>
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<td>-</td>
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<td>228</td>
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<td>-</td>
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<td>∅ 620</td>
<td>∅ 620</td>
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<td>∅ 56</td>
<td>∅ 56</td>
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</tr>
<tr>
<td>k</td>
<td>1170</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>n</td>
<td>400</td>
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<td>a</td>
<td>150</td>
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<td></td>
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<td></td>
</tr>
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<tr>
<td>q</td>
<td>840</td>
<td></td>
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</tr>
</tbody>
</table>

### Dimensions (mm):

- Oil Volume: 168 188 203 218 240 255
- Displacement: 297 320 348 366 392 436
- Max. Weight: 536 541 546 551 556 561

---

**OIL VOLUME** [dm³] 168 188 203 218 240 255

**DISPLACEMENT** [dm³] 297 320 348 366 392 436

**MAX. WEIGHT** [kg] 536 541 546 551 556 561

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For the type of OLTC-head refer to the order-specific drawing of the OLTC-head and drive shafts.

- Drive side of selector
- On-load tap-changer current take-off terminal
- Is connected to potential of A
- Shielding rings for UMD of 170 kV or greater
- Supporting flange for bell-type tank installation with 72.5kV-315kV available with 362kV obligatory

1. Bottom-most live parts, these are connected to the potential of the associated and/or wired connection contact
2. Selector base is made of insulating material

- The detailed connection diagram is binding for the designation of the connection contacts and phases
- C-E refer to 10016570
- For inherent drawings refer to 10009731
- D-D - Type with connecting lead 3W316 refer to 10017264

ON-LOAD TAP-CHANGER OILTAP® R
RI2002-725_362-RE
DIMENSION DRAWING
## OILTAP® R

### SELECTOR SIZE

<table>
<thead>
<tr>
<th>Unit (kV)</th>
<th>72.5</th>
<th>123</th>
<th>170</th>
<th>245</th>
<th>300</th>
<th>362</th>
</tr>
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<tbody>
<tr>
<td>h</td>
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<td>2655</td>
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<td>592</td>
<td>592</td>
<td>592</td>
</tr>
<tr>
<td>i</td>
<td>135</td>
<td>1445</td>
<td>1545</td>
<td>1645</td>
<td>1791</td>
<td>1921</td>
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<tr>
<td>s</td>
<td>-</td>
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<td>324</td>
<td>424</td>
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</tr>
<tr>
<td>z</td>
<td>-</td>
<td>-</td>
<td>191</td>
<td>191</td>
<td>191</td>
<td>228</td>
</tr>
<tr>
<td>x</td>
<td>-</td>
<td>-</td>
<td>Φ 620</td>
<td>Φ 620</td>
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</tr>
<tr>
<td>y</td>
<td>-</td>
<td>-</td>
<td>Φ 56</td>
<td>Φ 56</td>
<td>Φ 56</td>
<td>Φ 100</td>
</tr>
</tbody>
</table>

### DIMENSIONS (mm)

- k: 1170
- n: 400
- a: 150
- j: 290
- r: 150
- q: 840

### OIL VOLUME (dm³)

- 168
- 188
- 203
- 218
- 240
- 255

### DISPLACEMENT (dm³)

- 297
- 320
- 348
- 366
- 392
- 436

### MAX. WEIGHT (kg)

- 536
- 541
- 546
- 551
- 556
- 561

---

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FOR THE TYPE OF OLT-HEAD REFER TO THE ORDER-SPECIFIC DRAWING OF THE OLT-HEAD AND DRIVE SHAFTS.

M - DRIVE SIDE OF SELECTOR
A - ON-LOAD TAP-CHANGER CURRENT TAKE-OFF TERMINAL
B - IS CONNECTED TO POTENTIAL OF (A)
C - SHIELDING RINGS FOR LIMIT OF 170 KV OR GREATER
D - SUPPORTING FLANGE FOR BELL-TYPE TANK INSTALLATION WITH 72.5 KV-316 KV AVAILABLE WITH 362 KV OBLIGATORY
1 - BOTTOM-MOST LIVE PARTS, THESE ARE CONNECTED TO THE POTENTIAL OF THE ASSOCIATED AND/OR WIRED CONNECTION CONTACT
2 - SELECTOR BASE IS MADE OF INSULATING MATERIAL

- THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE CONNECTION CONTACTS AND PHASES
- C-E REFER TO 1006570
- D-F REFER TO 1009731
- D-D - TYPE WITH CONNECTING LEAD 3W/36 REFER TO 10017264
<table>
<thead>
<tr>
<th>DIMENSIONS (mm)</th>
<th>72.5</th>
<th>123</th>
<th>170</th>
<th>245</th>
<th>300</th>
<th>362</th>
</tr>
</thead>
<tbody>
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<td>2615</td>
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<td>529</td>
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</tr>
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<td>191</td>
<td>191</td>
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</tr>
<tr>
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</tr>
<tr>
<td>q</td>
<td>840</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>OIL VOLUME [dm³]</td>
<td>148</td>
<td>188</td>
<td>203</td>
<td>218</td>
<td>240</td>
<td>255</td>
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<tr>
<td>DISPLACEMENT [dm³]</td>
<td>297</td>
<td>320</td>
<td>348</td>
<td>366</td>
<td>392</td>
<td>436</td>
</tr>
<tr>
<td>MAX. WEIGHT [kg]</td>
<td>536</td>
<td>541</td>
<td>546</td>
<td>551</td>
<td>556</td>
<td>561</td>
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</table>

ON-LOAD TAP-CHANGER OILTAP® R
RI2003-72.5-362-RE
DIMENSION DRAWING
FOR THE TYPE OF OLTC-HEAD REFER TO THE ORDER-SPECIFIC DRAWING OF THE OLTC-HEAD AND DRIVE SHAFTS

- DRIVE SIDE OF SELECTOR
- ON-LOAD TAP-CHANGER CURRENT TAKE-OFF TERMINAL
- IS CONNECTED TO POTENTIAL OF A
- SHIELDING RINGS FOR UMF OF 170 KV OR GREATER
- SUPPORTING FLANGE FOR BELL-TYPE TANK INSTALLATION WITH 72.5kV-300kV AVAILABLE
  WITH 362kV OBLIGATORY
- BOTTOM-MOST LIVE PARTS, THESE ARE CONNECTED TO THE POTENTIAL OF THE ASSOCIATED AN/AN: WIRED CONNECTION CONTACT
- SELECTOR BASE IS MADE OF INSULATING MATERIAL

- THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE CONNECTION CONTACTS AND PHASES
- C-C REFER TO 1006570
- FOR INHERENT DRAWINGS REFER TO 10009731
- D-D - TYPE WITH CONNECTING LEAD 3W36 REFER TO 10017264
## SELECTOR SIZE

<table>
<thead>
<tr>
<th>Um (kV)</th>
<th>170</th>
<th>245</th>
<th>300</th>
<th>362</th>
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<tbody>
<tr>
<td>h</td>
<td>2785</td>
<td>3015</td>
<td>3115</td>
<td>3261</td>
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<tr>
<td>b</td>
<td>592</td>
<td>592</td>
<td>592</td>
<td>592</td>
</tr>
<tr>
<td>i</td>
<td>13</td>
<td>34</td>
<td>35</td>
<td>179</td>
</tr>
<tr>
<td>s</td>
<td>-</td>
<td>-</td>
<td>32</td>
<td>42</td>
</tr>
<tr>
<td>z</td>
<td>-</td>
<td>-</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>x</td>
<td>-</td>
<td>-</td>
<td>Ø 620</td>
<td>620</td>
</tr>
<tr>
<td>y</td>
<td>-</td>
<td>-</td>
<td>Ø 56</td>
<td>56</td>
</tr>
</tbody>
</table>

## DIMENSIONS (mm)

- k: 470
- n: 400
- a: 150
- t: 290
- p: 150
- r: 990

## OIL VOLUME (dm³)

| 168 | 188 | 203 | 218 | 240 | 255 |

## DISPLACEMENT (dm³)

| 314 | 337 | 355 | 383 | 409 | 453 |

## MAX. WEIGHT (kg)

| 606 | 611 | 696 | 621 | 626 | 631 |
5.5 Desenhos de instalação VACUTAP® VM®, OILTAP® M e OILTAP® R
11 Mounting flange on transformer cover
12 Fixing screw M12
13 On-load tap-changer head gasket
14 Tap position indicator
15 Inspection window
16 Drive shaft for tap position indicator
17 Through-holes ø15 mm

21 On-load tap-changer head
22 Screw for on-load tap-changer head cover
23 Gasket for on-load tap-changer head cover
24 On-load tap-changer head cover
25 Centric gear unit with drive shaft 25a
26a Pipe connection R for protective relay
26b Pipe connection S for suction pipe
26c Pipe connection Q for oil return (with oil filter only)
27a Air-vent valve of on-load tap-changer head cover
27b Bleeding facility for transformer oil compartment
27c Vent screw for suction pipe

31 Oil compartment
32 Oil compartment base
33 Screening ring (with Um = 170kV to 362kV only)
34 Oil compartment contact
36 On-load tap-changer current take-off terminal
37 Connection lead
38 Suction pipe

41 Selector suspension
42 Selector gear
43 Tap selector
44 Change-over selector
45 Selector connection contacts (refer to 10009917)
46 Selector take-off lead

51 Diverter switch insert
52 Supporting cylinder
53 Base plate
54 Fixing screw
55 Eyebolt through-holes ø25
56 Transition resistors

1 Maximum withdrawal height:
  72.5 kV --- 1350 mm
  123 kV --- 1480 mm
  170 kV --- 1580 mm
  245 kV --- 1680 mm
  300 kV --- 1826 mm
  362 kV --- 1956 mm

M Drive side of selector

Transformer tank bottom
5.6 Classes do seletor RC, RD, RDE, RE e RF
CONTACT ARRANGEMENT - WITHOUT CHANGE-OVER SELECTOR

Fig. 1: Drive side of selector

Designation of selector connection contact
E.g.: 3 = Upper selector plane
      4 = Lower selector plane

The detailed connection diagram is binding for the designation of the connection contacts and phases.
CONTACT ARRANGEMENT - WITHOUT CHANGE-OVER SELECTOR

DESIGNATION OF SELECTOR CONNECTION CONTACT
E.G.: 3 = UPPER SELECTOR PLANE
(4) = LOWER SELECTOR PLANE

THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE CONNECTION CONTACTS AND PHASES
REVERSING CHANGE-OVER SELECTOR

3 SELECTOR PLANES WITH PARALLEL BRIDGE

2 SELECTOR PLANES WITH PARALLEL BRIDGE

WITHOUT PARALLEL BRIDGE

ONLY 10193W .. 18353W (OPTIONAL)

SELECTOR SIZE RC/RD/RDE
PARALLEL BRIDGE/CONNECTING LUG
DIMENSION DRAWING
COARSE CHANGE-OVER SELECTOR

3 SELECTOR PLANES WITH PARALLEL BRIDGE

2 SELECTOR PLANES WITH PARALLEL BRIDGE

WITHOUT PARALLEL BRIDGE

SEPARATOR SIZE RC/RD/RDE
PARALLEL BRIDGE/CONNECTING LUG
DIMENSION DRAWING
COARSE CHANGE-OVER SELECTOR

3 SELECTOR PLANES WITH PARALLEL BRIDGE

2 SELECTOR PLANES WITH PARALLEL BRIDGE

W1

W2

U1

U2

V

F

G

H

15
102

15
102

52

52

B-B

U1 U2

W1 W2

3G (OPTIONAL)

PHASES
REVERSING CHANGE-OVER SELECTOR

COARSE CHANGE-OVER SELECTOR

Drive side of selector

The detailed connection diagram is binding for the designation of the connection contacts and phases.
REVERSING CHANGE-OVER SELECTOR

COARSE CHANGE-OVER SELECTOR

THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE CONNECTION CONTACTS AND PHASES.
5.7 Conexão ao potencial VACUTAP® VM® e OILTAP® M
PRODUKT RANGE POTENTIAL CONNECTION UNIT WITH TIE-IN SWITCH WP/GP

<table>
<thead>
<tr>
<th>ON-LOAD TAP-CHANGER</th>
<th>NUMBER PHASES</th>
<th>CIRCUIT RESISTORS</th>
<th>Um (kV)</th>
<th>POTENTIAL NUMBER OF RESISTORS PER PHASES</th>
<th>MAX DIMENSIONS a (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OILTAP® M</td>
<td>SERIES</td>
<td>725 . 300</td>
<td>3 . 22</td>
<td>590</td>
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<tr>
<td></td>
<td>PARALLEL</td>
<td>725 . 245</td>
<td>2x3 . 2x11</td>
<td>782</td>
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<td></td>
<td></td>
<td>300</td>
<td>2x3 . 2x4</td>
<td>782</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>725 . 245</td>
<td>3x3 . 3x8</td>
<td>590</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>300</td>
<td>3x3 . 3x10</td>
<td>782</td>
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<td>SERIES</td>
<td>725 . 245</td>
<td>3 . 10</td>
<td>590</td>
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<tr>
<td></td>
<td>PARALLEL</td>
<td>725 . 245</td>
<td>2x3 . 2x4</td>
<td>590</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>300</td>
<td>2x3 . 2x5</td>
<td>782</td>
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<td>SERIES</td>
<td>725 . 245</td>
<td>3 . 8</td>
<td>590</td>
<td></td>
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<tr>
<td></td>
<td>PARALLEL</td>
<td>725 . 245</td>
<td>2x3</td>
<td>590</td>
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<td></td>
<td></td>
<td>725 . 300</td>
<td>3 . 22</td>
<td>590</td>
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<td>PARALLEL</td>
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<td></td>
<td>170 . 300</td>
<td>2x3 . 2x4</td>
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<td>PARALLEL</td>
<td>725 . 123</td>
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<td>170 . 300</td>
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<td>782</td>
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<td>PARALLEL</td>
<td>725 . 123</td>
<td>2x3</td>
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<td></td>
<td>170 . 245</td>
<td>2x3 . 2x4</td>
<td>782</td>
<td></td>
</tr>
</tbody>
</table>

VACUTAP® VM

|                     | SERIES        | 725 . 123        | 3 . 10  | 590                                    |
|                     | PARALLEL      | 725 . 123        | 2x3     | 590                                    |
|                     |               | 170 . 245        | 2x3 . 2x4 | 590                                  |
|                     |               | 170 . 245        | 2x3 . 2x4 | 782                                  |

VMIII650Y VARIANT DISPLAYED

NUMBER AND POSITION OF CONNECTION CONTACT 2

SCREW CONNECTION BETWEEN POTENTIAL CONNECTION UNIT AND TAKE-OFF RING (2)

THE SCREW CONNECTION (IF AVAILABLE) IS MADE BY THE TRANSFORMER MANUFACTURER.

SERIES - DRIVE SIDE OF SELECTOR
PARALLEL - ON-LOAD TAP-CHANGER CURRENT TAKE-OFF TERMINAL
A - IS CONNECTED TO POTENTIAL OF A
PK - CONNECTION CONTACT
PS - TIE-IN SWITCH
1 - REFER TO DIMENSION DRAWING
2 - IS ORDER RELATED, REFER TO ORDER RELATED DIMENSION DRAWING

- THE DETAILED CONNECTION DIAGRAM IS BUNDING FOR THE DESIGNATION OF THE CONNECTION CONTACTS AND PHASES

ON-LOAD TAP-CHANGER OILTAP® M, VACUTAP® VM
POTENTIAL CONNECTION UNIT WP/GP-SELECTOR SIZE RC/RD/RDE
DIMENSION DRAWING

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PRODUCT RANGE POTENTIAL CONNECTION UNIT WITHOUT TIE-IN SWITCH WR/GR

<table>
<thead>
<tr>
<th>On-Load Tap-Changer</th>
<th>Number of Phases</th>
<th>Circuit Resistors</th>
<th>Potential Number of Resistors Per Phases</th>
<th>Max Dimensions a (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oiltap® M</td>
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<td>I</td>
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<td>725 . 300</td>
<td>3 . 22</td>
<td>946</td>
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<td>725 . 245</td>
<td>2x3 . 2x16</td>
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<td>725 . 245</td>
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<td>3 . 4</td>
<td>590</td>
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<tr>
<td></td>
<td>PARALLEL</td>
<td>300</td>
<td>3 . 18</td>
<td>782</td>
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<td>PARALLEL</td>
<td>725 . 245</td>
<td>2x3 . 2x7</td>
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<td>SERIES</td>
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<td>3 . 12</td>
<td>590</td>
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<td>3x3 . 3x12</td>
<td>782</td>
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<td></td>
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<td>782</td>
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VACUTAP® VM

<table>
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<tr>
<th>On-Load Tap-Changer</th>
<th>Number of Phases</th>
<th>Circuit Resistors</th>
<th>Potential Number of Resistors Per Phases</th>
<th>Max Dimensions a (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>SERIES</td>
<td>725 . 123</td>
<td>3 . 12</td>
<td>590</td>
</tr>
<tr>
<td></td>
<td>PARALLEL</td>
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<td></td>
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<td>590</td>
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<tr>
<td></td>
<td>300</td>
<td>2x3 . 2x8</td>
<td>782</td>
<td></td>
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</table>

1. REFER TO DIMENSION DRAWING
2. IS ORDER RELATED, REFER TO ORDER RELATED DIMENSION DRAWING
- THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE CONNECTION CONTACTS AND PHASES

SCREW CONNECTION BETWEEN POTENTIAL CONNECTION UNIT AND TAKE-OFF RING Z

THE SCREW CONNECTION (IF AVAILABLE) IS MADE BY THE TRANSFORMER MANUFACTURER.

M - DRIVE SIDE OF SELECTOR
A - ON-LOAD TAP-CHANGER CURRENT TAKE-OFF TERMINAL
B - IS CONNECTED TO POTENTIAL OF A
PK - CONNECTION CONTACT

DIMENSION DRAWING 100179520E SHEET 1/1
5.8 Conexão ao potencial OILTAP® R
WITH CHANGE-OVER SELECTOR
(REVERSING / COARSE CHANGE-OVER SELECTOR)  W. G

R III 1200Y VARIANT DISPLAYED

NUMBER AND POSITION OF CONNECTION CONTACT 2

SCREW CONNECTION BETWEEN
POTENTIAL CONNECTION UNIT AND
TAKE-OFF RING 2

THE SCREW CONNECTION (IF AVAILABLE) IS
MADE BY THE TRANSFORMER MANUFACTURER.

M - DRIVE SIDE OF SELECTOR
A - ON-LOAD TAP-CHANGER CURRENT
TAKE-OFF TERMINAL
B - IS CONNECTED TO POTENTIAL OF A
PK - CONNECTION CONTACT
1 - REFER TO DIMENSION DRAWING
2 - IS ORDER RELATED, REFER TO
ORDER RELATED DIMENSION DRAWING
- THE DETAILED CONNECTION
DIAGRAM IS BINDING FOR THE
DESIGNATION OF THE CONNECTION
CONTACTS AND PHASES

ON-LOAD TAP-CHANGER OILTAP® R
POTENTIAL CONNECTION UNIT WR/GR-SELECTOR SIZE RC/RO/ROE
DIMENSION DRAWING

PRODUCT RANGE POTENTIAL CONNECTION UNIT WITHOUT TIE-IN SWITCH WR/GR

<table>
<thead>
<tr>
<th>PHASES</th>
<th>NUMBER</th>
<th>CIRCUIT RESISTORS</th>
<th>UN (kV)</th>
<th>POTENTIAL NUMBER OF RESISTORS PER PHASES</th>
<th>MAX. DIMENSIONS a (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>SERIES</td>
<td>725...362</td>
<td>322</td>
<td>894</td>
<td>496</td>
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<tr>
<td>R</td>
<td>PARALLEL</td>
<td>725...362</td>
<td>2x3 2x22</td>
<td>946</td>
<td>496</td>
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<tr>
<td>R 20011</td>
<td>3-FOLD PARALLEL</td>
<td>725...362</td>
<td>3x3 3x18</td>
<td>1048</td>
<td>821</td>
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<tr>
<td>R 20011</td>
<td>PARALLEL</td>
<td>725...362</td>
<td>3x3 3x20</td>
<td>1048</td>
<td>821</td>
</tr>
<tr>
<td>R</td>
<td>SERIES</td>
<td>725...362</td>
<td>322</td>
<td>1048</td>
<td>821</td>
</tr>
<tr>
<td>R</td>
<td>PARALLEL</td>
<td>725...362</td>
<td>2x3 2x11</td>
<td>1048</td>
<td>821</td>
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<tr>
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<td>SERIES</td>
<td>725...362</td>
<td>322</td>
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<td>821</td>
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<tr>
<td>R 20011</td>
<td>PARALLEL</td>
<td>725...362</td>
<td>2x3 2x8</td>
<td>1048</td>
<td>821</td>
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</table>
# ON-LOAD TAP-CHANGER OILTAP® R

## Potential Connection Unit WP/GP - Selector Size RC/RO/RDE

### Dimension Drawing

<table>
<thead>
<tr>
<th>Number</th>
<th>Circuit Resistors</th>
<th>Um (kV)</th>
<th>Potential Number of Resistors Per Phases</th>
<th>Max. Dimensions a (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>SERIES</td>
<td>72.5 . 362</td>
<td>3 . 22</td>
<td>8 94</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>3 . 18</td>
<td>4 96</td>
</tr>
<tr>
<td>R</td>
<td>PARALLEL</td>
<td>72.5 . 123</td>
<td>2 x 3 . 2 x 20</td>
<td>8 21</td>
</tr>
<tr>
<td>R</td>
<td></td>
<td>170 . 362</td>
<td>2 x 3 . 2 x 22</td>
<td>10 48</td>
</tr>
<tr>
<td>R</td>
<td></td>
<td>72.5 . 362</td>
<td>2 x 3 . 2 x 18</td>
<td>4 96</td>
</tr>
<tr>
<td>R</td>
<td>3-FOLD</td>
<td>72.5 . 123</td>
<td>3 x 3 . 3 x 14</td>
<td>8 21</td>
</tr>
<tr>
<td>R</td>
<td>PARALLEL</td>
<td>170 . 362</td>
<td>3 x 3 . 3 x 16</td>
<td>10 48</td>
</tr>
<tr>
<td>R</td>
<td></td>
<td>72.5 . 362</td>
<td>3 x 3 . 3 x 6</td>
<td>4 96</td>
</tr>
<tr>
<td>R</td>
<td>SERIES</td>
<td>72.5 . 123</td>
<td>3 . 18</td>
<td>8 21</td>
</tr>
<tr>
<td>R</td>
<td>PARALLEL</td>
<td>170 . 362</td>
<td>2 x 3 . 2 x 10</td>
<td>10 48</td>
</tr>
<tr>
<td>R</td>
<td></td>
<td>72.5 . 123</td>
<td>2 x 3 . 2 x 8</td>
<td>8 21</td>
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<tr>
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<td>PARALLEL</td>
<td>170 . 362</td>
<td>2 x 3 . 2 x 10</td>
<td>10 48</td>
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<td>8 21</td>
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<td>R</td>
<td>PARALLEL</td>
<td>170 . 362</td>
<td>3 . 16</td>
<td>10 48</td>
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<tr>
<td>R</td>
<td></td>
<td>72.5 . 123</td>
<td>2 x 3 . 2 x 6</td>
<td>8 21</td>
</tr>
<tr>
<td>R</td>
<td>PARALLEL</td>
<td>170 . 362</td>
<td>2 x 3 . 2 x 7</td>
<td>10 48</td>
</tr>
</tbody>
</table>

### Notes
- **M**: Drive side of selector
- **A**: On-load tap-changer current take-off terminal
- **B**: Is connected to potential of **A**
- **PK**: Connection contact
- **PS**: Tie-in switch
- **1**: Refer to dimension drawing
- **2**: Is order related, refer to order related dimension drawing
- The detailed connection diagram is binding for the designation of the connection contacts and phases.
THE DETAILED CONNECTION DIAGRAM IS BINDING FOR THE DESIGNATION OF THE CONNECTION CONTACTS AND PHASES.

POSITION OF CONNECTION CONTACT - ORDER RELATED

3-PHASE DESIGN

2-PHASE DESIGN

1-PHASE DESIGN
### On-Load Tap-Changer Oiltap® R

<table>
<thead>
<tr>
<th>Number Phases</th>
<th>Circuit Resistors</th>
<th>U_m (kV)</th>
<th>Potential Number of Resistors per Phases</th>
<th>Max. Dimensions a (mm)</th>
<th>Separate Transport Potential Connection Unit</th>
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</thead>
<tbody>
<tr>
<td>R Series</td>
<td>725 – 362</td>
<td>3.22</td>
<td>909</td>
<td>ND</td>
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<tr>
<td>R Series</td>
<td>725 – 362</td>
<td>3.12</td>
<td>496</td>
<td>ND</td>
<td></td>
</tr>
<tr>
<td>Parallel</td>
<td>170 – 362</td>
<td>2x3.2x3.2x16</td>
<td>821</td>
<td>ND</td>
<td></td>
</tr>
<tr>
<td>R Series</td>
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<td>3x3.3x3.12</td>
<td>496</td>
<td>ND</td>
<td></td>
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<tr>
<td>R Series</td>
<td>170 – 362</td>
<td>3x3.3x3.14</td>
<td>1063</td>
<td>ND</td>
<td></td>
</tr>
<tr>
<td>Parallel</td>
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<td>2x3.2x7</td>
<td>821</td>
<td>ND</td>
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<tr>
<td>R Parallel</td>
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<tr>
<td>Parallel</td>
<td>725 – 362</td>
<td>3.4</td>
<td>496</td>
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<tr>
<td>R Parallel</td>
<td>170 – 362</td>
<td>3.4</td>
<td>496</td>
<td>ND</td>
<td></td>
</tr>
<tr>
<td>Parallel</td>
<td>725 – 362</td>
<td>5.14</td>
<td>1063</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>R Parallel</td>
<td>170 – 362</td>
<td>5.14</td>
<td>1063</td>
<td>YES</td>
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</tr>
</tbody>
</table>

#### Potential Connection Unit WP/GP – Selector Size RE/RF

- **M**: Drive Side of Selector
- **A**: On-Load Tap-Changer Current Take-Off Terminal
- **B**: Is Connected to Potential of **A**
- **PK**: Connection Contact
- **PS**: Tie-In Switch

**Dimension Drawing**

- **1**: Refer to Dimension Drawing
- **2**: Is Order Related, Refer to Order Related Dimension Drawing
- The Detailed Connection Diagram is Binding for the Designation of the Connection Contacts and Phases

---

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VRMIIIY VARIANT DISPLAYED

- Drive side of selector
- On-load tap-changer current take-off terminal
- Connection contact
- Tie-in switch

Refer to dimension drawing

The detailed connection diagram is binding for the designation of the connection contacts and phases

Position of connection contact

Order related

3-phase design

2-phase design

1-phase design

Selector size RE/RF/RES

Tie-in switch WS/GS

Dimension drawing
5.9 Exemplos de esquema de ligação VACUTAP® VM®
 Für diese technische Unterlage behalten wir uns gemäß DRAWING BY CAD.

MOTORANREIB
MOTOR DRIVE UNIT

STELLUNG DES WENDERS
POSITION OF REVERSING CHANGE-OVER SELECTOR

BETRIEBSSTELLUNG
SERVICE POSITION

BEZEICHNUNG DER WÄHLERKONTAKTE
DESIGNATION OF TAP SELECTOR CONTACTS

VERSICHEDE SPANNUNGEN
DIFFERENT VOLTAGES

BEZEICHNUNG DER STELLUNGEN
DESIGNATION OF POSITIONS

JUSTIERSTELLUNG
ADJUSTMENT POSITION

REGELBEREICH (kV)
REGULATION RANGE (kV)
5.10 Exemplos de esquema de ligação OILTAP® M
STELLUNG DES WENDERS
POSITION OF REVERSING CHANGE-OVER SELECTOR

BETRIEBSSTELLUNG
SERVICE POSITION

VERSCHIEDENEN SPANNUNGEN
DIFFERENT VOLTAGES

JUSTIERSTELLUNG
ADJUSTMENT POSITION

BETRIEBSSTELLUNGEN
SERVICE POSITIONS 19

VERSCHIEDENE SPANNUNGEN
DIFFERENT VOLTAGES 19

JUSTIERSTELLUNG
ADJUSTMENT POSITION 10

REGELBREICH (kV)
REGULATION RANGE (kV)

MOTORANTRIEB
MOTOR DRIVE UNIT

STELLDUNG DES WENDERS
POSITION OF REVERSING CHANGE-OVER SELECTOR

BETRIEBSSTELLUNG
SERVICE POSITION

BEZEICHNUNG DER WÄHLERKONTAKTE
DESIGNATION OF TAP SELECTOR CONTACTS

BEZEICHNUNG DER STELLUNGEN
DESIGNATION OF POSITIONS

LASTSTUFENSCHALTER
ON-LOAD TAP-CHANGER

OILTAP® M III 600-Y-170/RC-10 19 1W

STANDARD VERIFIED
EXEC.

NO.
MODIFICATION
DATE
NAME
SH.
SHEET
DRAWING BY CAD
DO NOT MODIFY MANUALLY

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LANGUAGE:
PROJECT:
ORIGIN.
REPL.BY
REPL.

DE
EN

LANGUAGE: DE
PROJECT: 4327934_00

SCHALTBLATT
CONNECTION DIAGRAM

DE
EN

M III 600-Y-170/RC-10 19 1W

OILTAP®
LASTSTUFSCHALTER  
ON-LOAD TAP-CHANGER

BETRIEBSSTELLUNGEN  
SERVICE POSITIONS

VERSCHIEDENE SPANNUNGEN  
DIFFERENT VOLTAGES

JUSTIERSTELLUNG  
ADJUSTMENT POSITION

BEZEICHNUNG DER WAHLERKONTAKTE  
DESIGNATION OF TAP SELECTOR CONTACTS

BEZEICHNUNG DER STELLUNGEN  
DESIGNATION OF POSITIONS

REGELBEREICH (kV)  
REGULATION RANGE (kV)

18 STUFEN / STEPS

TW_0  
TRANSFORMER WINDING

TW_1  
TAP WINDING

LU  
DIVERTER SWITCH

MOTORANREIB  
DRIVE SIDE

KUNDEN VERBINDUNGEN  
CUSTOMER CONNECTIONS

MR CONNECTIONS

BESTIMMTER STUFEN / STEPS

STELLUNG DES WENDERS  
POSITION OF REVERSING CHANGE-OVER SELECTOR

BETRIEBSSTELLUNG  
SERVICE POSITION

OILTAP®  
ON-LOAD TAP-CHANGER

M I 1503-170/RC-18 35 1W

SCHALTbild  
CONNECTION DIAGRAM

DE  
EN

4327937_00

1 10
5.11 Exemplos de esquema de ligação OILTAP® R
ACHTUNG
PARALLELBÜCKEN VON MR NICHT ANBAUT
VON TS_1 NACH TS_2
VON TS_3 (PS_3) NACH TS_4 (PS_4)
ATTENTION!
PARALLEL BRIDGES ARE NOT INSTALLED BY MR
FROM TS_1 TO TS_2
FROM TS_3 (PS_3) TO TS_4 (PS_4)

MOTORANTRIEB
MOTOR DRIVE UNIT

TW_0
TRAFOWICKLUNG
TRANSFORMER WINDING

TW_1
STUFENWICKLUNG
TAP WINDING

LU
LASTUMSCHALTER
DIVERTER SWITCH

STELLUNG DES WENDERS
POSITION OF REVERSING CHANGE-OVER SELECTOR

BETRIEBSSTELLUNG
SERVICE POSITION

VERSCHIEDENEN SPANNUNGEN
DIFFERENT VOLTAGES

JUSTIERSTELLUNG
ADJUSTMENT POSITION

NEUE VERSION
NEW VERSION
Fuer diese technische Unterlage behalten wir gemaess DIN 34 Abschnitt 2.1 und 2.2 alle Rechte vor.

STELLPUNKT DES WENDERS
POSITION OF REVERSING CHANGE-OVER SELECTOR

MOTORANTRIEB
MOTOR DRIVE UNIT

VERSCHIEDENE SPANNUNGEN
DIFFERENT VOLTAGES

GETRIEBESEITE
DRIVE SIDE

BEZEICHNUNG DER WAHLERKONTAKTE
DESIGNATION OF TAP SELECTOR CONTACTS

BEZEICHNUNG DER STELLUNGEN
DESIGNATION OF POSITIONS

REGELBEREICH (kV)
REGULATION RANGE (kV)

BETRIEBSSTELLUNG
SERVICE POSITION

VEREINIGTE PHASEN
UNITED PHASES

WECHSELSTROMFÄHIG
AC CURRENT CAPABLE

EINZELSTUFEN/WICKLUNGEN
INDIVIDUAL STEPS/ WINDINGS

BETRIEBSSSTELLUNGEN
SERVICE POSITIONS

VERSCHIEDENE SPANNUNGEN
DIFFERENT VOLTAGES

JUSTIERSTELLUNG
ADJUSTMENT POSITION

LASSSTUFENSCHALTER
OILTAP® R I 3003-170/RC-18 35 1W
ON-LOAD TAP-CHANGER

PARALLELBRÜCKEN VON MR ANGEBAUT
FROM TS_1 TO TS_2 TO TS_3
FROM TS_4 (PS_4) TO TS_5 (PS_5) TO TS_6 (PS_6)
ATTENTION !
PARALLEL BRIDGES ARE INSTALLED BY MR
FROM TS_1 TO TS_2 TO TS_3
FROM TS_4 (PS_4) TO TS_5 (PS_5) TO TS_6 (PS_6)

STUFEN / STEPS
STEPS

STELLUNG DES WENDERS
POSITION OF REVERSING CHANGE-OVER SELECTOR

MOTORANTRIEB
MOTOR DRIVE UNIT

VERSCHIEDENE SPANNUNGEN
DIFFERENT VOLTAGES

BETRIEBSSTELLUNG
SERVICE POSITION
MR worldwide

Australia
Reinhausen Australia Pty. Ltd.
17/20-22 St Albans Road
Kingsgrove NSW 2208
Phone: +61 2 9502 2202
Fax: +61 2 9502 2224
E-Mail: sales@au.reinhausen.com

Brazil
MR do Brasil Indústria Mecâlica Ltda.
Av. Elias Yazbek, 465
CEP: 06803-000
Embu - São Paulo
Phone: +55 11 4785 2150
Fax: +55 11 4785 2185
E-Mail: vendas@reinhausen.com.br

Canada
Reinhausen Canada Inc.
3755, rue Java, Suite 180
Brossard, Québec J4Y 0E4
Phone: +1 514 370 3577
Fax: +1 450 659 3092
E-Mail: m.foata@ca.reinhausen.com

India
Easun-MR Tap Changers Ltd. (Joint Venture)
612, CTH Road
Tiruninravur, Chennai 600 024
Phone: +91 44 26300883
Fax: +91 44 26390881
E-Mail: service@easunmr.com

Indonesia
Pt. Reinhausen Indonesia
German Center, Suite 6310,
BSD City, Tangerang
Phone: +62 21 5315-3183
Fax: +62 21 5315-3184
E-Mail: c.haering@id.reinhausen.com

Iran
Iran Transfo After Sales Services Co. (Joint Venture)
Zanjan, Industrial Township No. 1 (Aliabad)
Corner of Morad Str.
Postal Code 4533144551
E-Mail: you-mi.jang@kr.reinhausen.com

Italy
Reinhausen Italia S.r.l.
Via Alserio, 16
20159 Milano
Phone: +39 02 69434766
Fax: +39 02 69434718
E-Mail: sales@it.reinhausen.com

Japan
MR Japan Corporation
German Industry Park
1-18-2 Hakusan, Midori-ku
Yokohama 226-0006
Phone: +81 45 929 5728
Fax: +81 45 929 5741
E-Mail: sales@ja.reinhausen.com

Luxembourg
Reinhausen Luxembourg S.A.
72, Rue de Prés
L-7333 Steinsel
Phone: +352 27 3347 1
Fax: +352 27 3347 99
E-Mail: sales@lu.reinhausen.com

Malaysia
Level 11 Chulan Tower
No. 3 Jalan Conlay
50450 Kuala Lumpur
Phone: +60 3 2142 6481
Fax: +60 3 2142 6422
E-Mail: mr_rap@my.reinhausen.com

P.R.C. (China)
MR China Ltd. (MRT)
开德贸易（上海）有限公司
中国上海浦东新区浦东南路360号
新上海国际大厦4楼E座
邮编：200120
电话：+ 86 21 61634588
传真：+ 86 21 61634582
邮箱: mr-sales@cn.reinhausen.com

Russian Federation
OOO MR
Naberezhnaya Akademika Tupoleva
15, Bid. 2 ("Tupolev Plaza")
105005 Moscow
Phone: +7 495 980 89 67
Fax: +7 495 980 89 67
E-Mail: mrr@reinhausen.ru

South Africa
Reinhausen South Africa (Pty) Ltd.
No. 15, Third Street, Booyens Reserve
Johannesburg
Phone: +27 11 8352077
Fax: +27 11 8353806
E-Mail: support@za.reinhausen.com

South Korea
Reinhausen Korea Ltd.
21st floor, Standard Chartered Bank Bldg.,
47, Chongro, Chongro-gu,
Seoul 110-702
Phone: +82 2 767 4909
Fax: +82 2 736 0049
E-Mail: you-mi.jang@kr.reinhausen.com

U.S.A.
Reinhausen Manufacturing Inc.
2549 North 9th Avenue
Humboldt, TN 38343
Phone: +1 731 784 7681
Fax: +1 731 784 7682
E-Mail: sales@reinhausen.com

United Arab Emirates
Reinhausen Middle East FZE
Dubai Airport Freezone, Building Phase 6
3rd floor, Office No. 6EB, 341 Dubai
Phone: +971 4 2368 451
Fax: +971 4 2368 225
Email: service@ae.reinhausen.com