

ON LOAD TAP CHANGERS



ON LOAD
TAP CHANGERS

WHY OLTC FROM HYUNDAI?

- Because it is our own patent-protected design using up-to-date technical achievements.
- Because we have 60 years of experience in production and more than 40 years of experience in export. With more than 50 000 pcs produced so far, we are among the leading companies in the world.
- Because our products are successfully tested by independent laboratories like KEMA – Holland, VUSE – Czech Republic, KERI – Korea, etc. and are approved by many national electricity authorities.
- Because we are flexible to change the design of our products in order to meet completely your technical requirements and delivery terms.
- Because our compact design and dependable technical parameters will reduce the overall dimensions and weight of your transformer.
- Because our design is reliable in operation and easy for maintenance.



LONGSTANDING TRADITION IN DEVELOPMENT AND PRODUCTION OF ON LOAD TAP CHANGERS (OLTCs)

1952-1958

Limited quantities of OLTCs were being produced for installation under transformer covers.

1958

The production of RS 1 OLTC series was started. It was used for one year in transformer production.

1964-1967

The RS 2 and RS 3 OLTC series were developed and implemented with the purpose of being used in the former COMECON countries.

1975

The production of a new OLTC series was started – RS 4 combined with the MZ 4 motor drive unit.

1988

The RS 9 OLTC series was introduced in regular production.

1988-1994

New OLTC series were developed and introduced in regular production – RS 5, RS 6, RS 7, RS 12, RS 16.

1997

The Sofia plant became the property of Hyundai Heavy Industries Co. Ltd.-Korea.

1998-present

New OLTC series with vacuum interrupters are being developed - RSV 5, RSV 9, RS 21. The RS 21 series was designed for use in gas transformers. An improved light OLTC series was developed – RS 12. In our program for 2010-2011, we have included the development of more new OLTC series with vacuum interrupters: RSV 6-III-1250, RSV 6-I-2000, RSV 16.



All of the above mentioned types meet the requirements of the IEC 60214-1-2003 standard.

OLTC SERIES IN REGULAR PRODUCTION meeting the requirements of the IEC 60214-1-2003 standard



RS 9 and RS 9.3 Series

- Rated currents (A):
 - 200, 400, 630 – three phase design for regulation at neutral point
 - 200, 400, 630, 1200 and 1600 – single phase design for all connection diagrams
- Rated voltage (kV):
 - 41,5; 72,5; 123; 170; 245 and 300
- Step voltage (V):
 - up to 4000
- Connection diagrams:
 - with and without coarse and reverse change-over selector
- Number of steps:
 - up to 35
- Selector switch insulation level:
 - K, L, M, N and P
- Carrying flange shape:
 - round or elliptic

RS 6 and RS 6.3 Series

- Rated currents (A):
 - up to 1250 – three phase design for regulation at neutral point
 - up to 2000 – single phase design for all connection diagrams
- Rated voltage (kV):
 - up to 245
- Step voltage (V):
 - up to 2500
- Connection diagrams:
 - with and without coarse and reverse change-over selector
- Number of steps:
 - up to 27
- Selector switch insulation level:
 - K, L, M and N
- Carrying flange shape:
 - round or elliptic



RS 5 and RS 5.3 Series

- Rated currents (A):
 - 200, 400, 630 and 1250 – three phase design for delta connected windings
- Rated voltage (kV):
 - 41,5 and 72,5 – full insulation between phases of delta connected windings
- Step voltage (V):
 - up to 4000
- Connection diagrams:
 - with and without coarse and reverse change-over selector
- Number of steps:
 - up to 27
- Selector switch insulation level:
 - 41,5 and 72,5
- Carrying flange shape:
 - round or elliptic
- Special design
 - with vacuum interrupters for 1250 A (RSV 5 type)





RS 7 Series

OLTCs with an increased number of tap positions utilizing five coarse change-over selectors.

- Number of steps:
 - up to 125
- Rated currents (A):
 - 200, 400, 630 – three phase design
 - 200, 400, 630 and 800 – single phase design
- Rated voltage (kV):
 - 41,5; 72,5 and 123 – three phase design for star connected windings and 41,5 – for delta connected windings
 - 41,5; 72,5; 123; 170 and 245 – single phase design
- Connection diagrams:
 - with multiple change-over selectors
- Selector switch insulation level
 - K and L for single phase design
 - K, L, M and N for three phase design
- Special design
 - with vacuum interrupters (RSV 7 type)

RS 12 Series

OLTCs with a vertical three phase arrangement for star and delta connected windings.

- Rated currents (A):
 - 200 and 400
- Rated voltage (kV):
 - 41,5; 72,5 and 123 – for star connected windings
 - 41,5 and 72,5 – for delta connected windings
- Step voltage (V):
 - up to 2500
- Range voltage (kV):
 - 180
- The reverse and coarse change-over selector situated in pure transformer oil
- Special design
 - with vacuum interrupters (RSV 12 type)



NEW SERIES ON LOAD TAP CHANGERS (OLTCs)



RS 21 Series

OLTCs with gas insulation

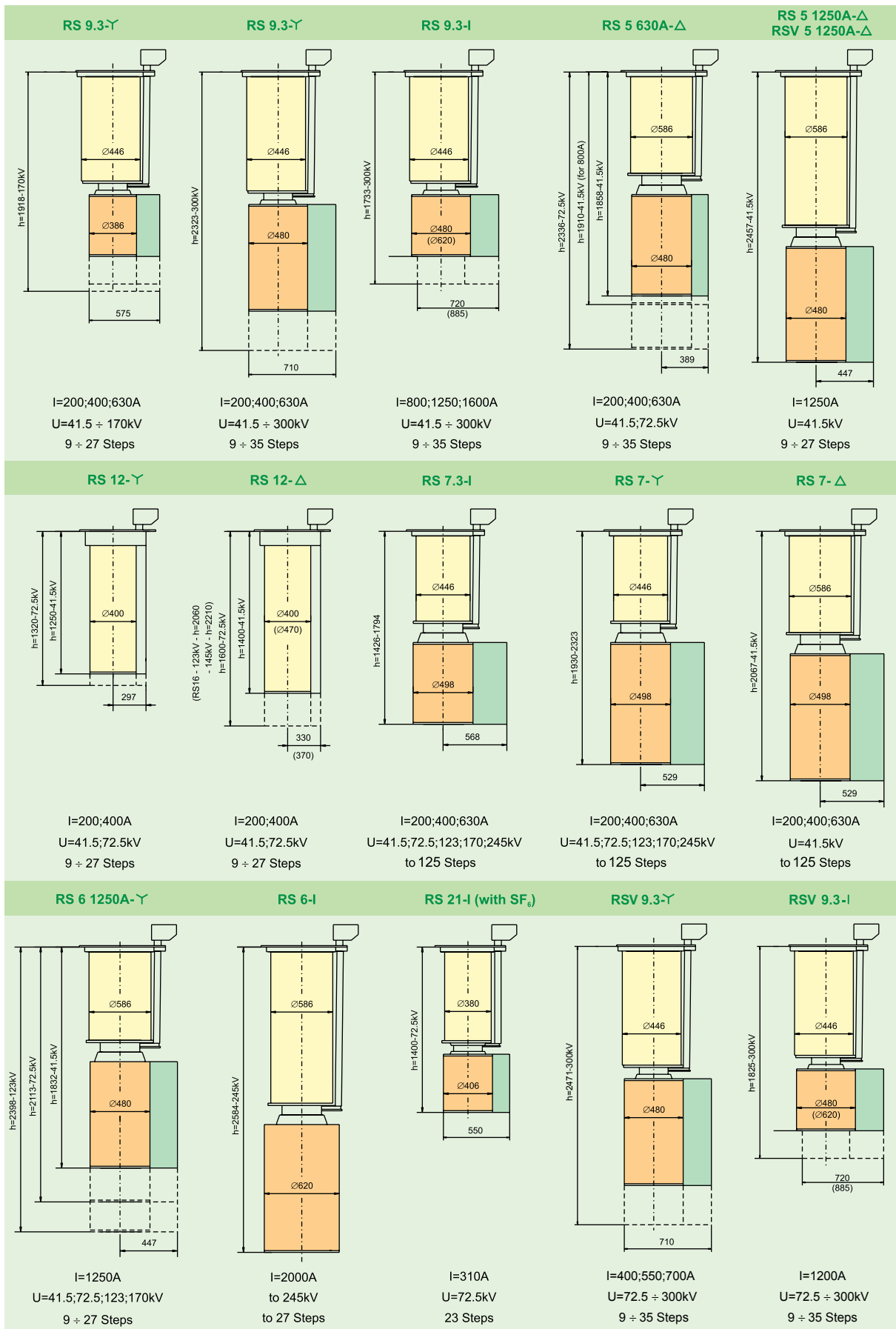
- Rated currents (A):
 - 310 – single phase design
- Rated voltage (kV) – 72,5
- Step voltage (V) – 1200
- Connection diagrams – reverse change-over selector.
- Number of steps:
 - up to 23
- Selector switch insulation level: L
- Carrying flange shape – elliptic

RSV 9.3 Series

- Rated currents (A):
 - 400, 550, 7000 – three phase design for regulation at neutral point
 - 400, 550, 700, 1200 – single phase design for all connection diagrams.
- Rated voltage (kV):
 - 72,5; 123; 170; 245 and 300
- Step voltage (V):
 - up to 3500 for 400A; 3000 for 550A and 700A; 2500 for 1200A.
- Connection diagrams:
 - with and without coarse and reverse change-over selector
- Number of steps:
 - up to 35
- Selector switch insulation level:
 - K, L, M, N and P
- Carrying flange shape:
 - round



ON LOAD TAP CHANGERS OF HHI BULGARIA



Note:

For more detailed information, please see the catalogs of the specific products.

MOTOR DRIVE UNITS (MDUs)



MZ 4.1



MZ 4.4

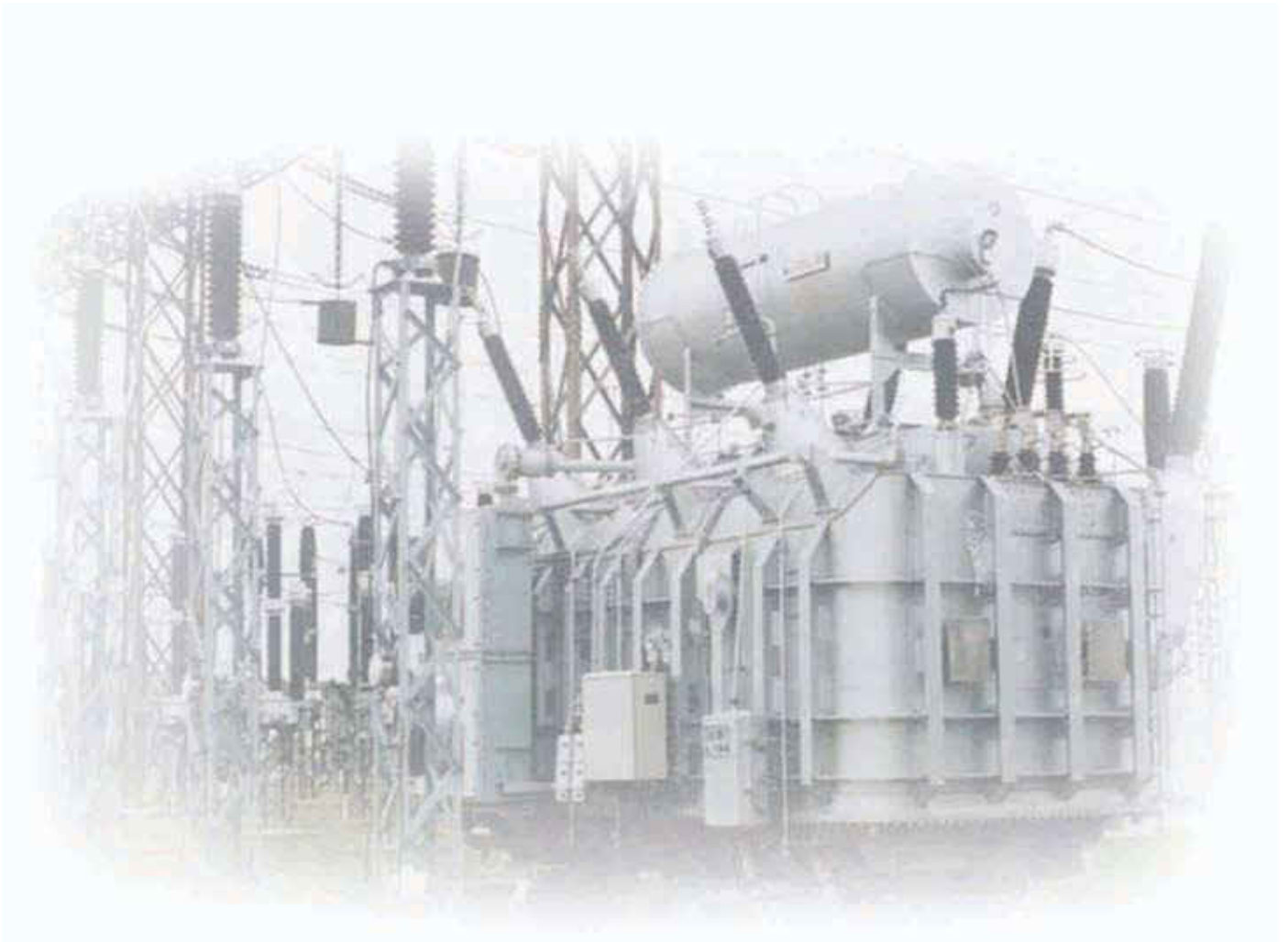
- The MDUs are designed for lateral installation onto the transformer tank (deep or bell type) at a vertical level convenient for control and maintenance.
- The MDU design is suitable for all climatic conditions.
- The MDUs meet the requirements of the IEC 60214-1-2003 standard
- The MZ 4.4 MDUs meet the requirements of the ANSI standard.

TECHNICAL DATA

Motor Drive Unit		MZ 4.4	MZ 4.1
Rated power of el. motor	kW	0,75 / 1,1(0,9/1,3 for 60 Hz)	0,75 / 1,1(0,9/1,3 for 60 Hz)
Rated frequency	Hz	50 / 60	50 / 60
Supply voltage	V	3 AC 400 / 230	3 AC 400 / 230
Synchronous speed	min-1	1500 (1800 for 60 Hz)	1500 (1800 for 60 Hz)
Revolutions of manual crank per tap change operation	revs	33	33
Torque of driving shaft	Nm	17 / 24	17 / 24
Running time per tap change operation	s	4,5	4,5
Max. number of operating positions		38	38
Control circuit voltage	V	AC 230	AC 230
Insulation level	kV	2,5	2,5
Heating element power	W	250	2x150
Protection degree		IP 54	IP 54
Weight	kg	104	80

There are also MDU special designs to meet the specific requirements of our clients such as:

- Protection degree IP 65
- Revolutions of outgoing driving shaft per tap change operation: 0,5; 1; 6; 16,5 ; 33.
- Number of steps – up to 125



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