

## Improvement actions: E/R module supply

according to ISO/DIS 14955-1

No.	Requirements on	Description	Relevant for machine type	Estimated Energy savings
1	Minimize energy losses in power supplies	Usage of high efficiency transformer or voltage-proof converters instead of conventional transformers (e.g. controlled switching power for auxiliary power 24V).	Metal cutting	3,1 – 3,6%
2	Avoidance energy losses of power supplies	Avoid power losses in the transformer by use of e. g. voltage-proof converter, controlled switching power supply for 24V control voltage	Mechanical Press; Servo Press; Hydraulic Press	
3	Converter with power factor correction	Power factor in the infeed unit for feed operation and regenerative feedback saves energy losses.	Metal cutting	3,7 – 4,5%
4	High efficiency transformer	Load requirement of a machine tool is not constant during the cycle. Therefore it is more efficient to install transformers optimized on low Fe- losses instead of transformers optimized on low Cu- losses.	Mechanical Press; Servo Press; Hydraulic Press	3,1 – 3,6%
5	Thermal management regarding control cabinet	Optimized concept for thermal management of the control cabinet;1. Minimization of waste heat;2. If waste heat is not avoidable, it has to be dissipated (air cooling or water cooling); for reuse of thermal energy water is given a preference compared to air; further use of waste heat has to be checked/discussed with customer; 3. Controlled ventilation (fan).	Metal cutting	3,7 – 4,5%
6	Apply the simultaneity factor when designing the power system	Avoid oversizing of power supply leads to lower absolute energy losses. Avoid overload as well.	Mechanical Press; Servo Press; Hydraulic Press	3,7 – 4,5%

7	Converter/inverter with power factor correction	Power factor in the infeed unit for feed operation and regenerative feedback saves power losses.	Mechanical Press; Servo Press; Hydraulic Press	3,7 – 4,5%
8	Thermal management regarding control cabinet	Optimized concept for thermal management of the control cabinet;1. minimization of waste heat;2. if waste heat is not avoidable, it has to be dissipated (air cooling or water cooling); for reuse of thermal energy water is given a preference compared to air; further use of waste heat has to be checked/discussed with customer;3. controlled ventilation (fan);4. low maintenance air conditioner (no air filter) and thermostatic air conditioning with open-door-shutoff.	Mechanical Press; Servo Press; Hydraulic Press	3,7 – 4,5%